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Trends Between Student Gender, SES, Ethnicity, LEP, Disabilities and Kentucky Core Content Test Performance

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Abstract

As part of recent "No Child Left Behind" (NCLB) legislation, education communities have been mandated to close gaps in academic performance across a range of student subgroups, including gender, ethnicity, disability, socioeconomic status (SES) and limited English proficiency (LEP). This report looks at mean scale score differences on the Kentucky Core Content Test (KCCT) among these five student subgroups. Mean scale scores are presented graphically to depict changes in performance by subgroup between testing years 1999-2002.

Student subgroup populations have remained stable over the four-year period, with no large fluctuations in size. Performance gaps between the various groups reflect expected patterns (based on other state and national measures of achievement), and these gaps have been largely maintained over time. White students' mean scores are consistently higher than African-Americans' and Hispanics' mean scores, females higher than males (with the exception of science where males and females scores are essentially identical), students without disabilities higher than students with disabilities, students ineligible for free/reduced lunch higher than those meeting eligibility requirements (a proxy for SES), and non-LEP students higher than those with limited proficiency in English. An important caveat to these findings, however, is that the variability within any of the analyzed groups is much larger than the difference in their mean scores. Graphics in this report include bars at each data point depicting one standard deviation above and below the mean, which will encompass roughly the two-thirds of students making up the center of the overall group distribution. Membership in a traditionally lower-achieving group does not indicate that particular students in the group will be lower achieving; conversely, many students in lower scoring groups score above the mean of the higher scoring group. While plotting means highlights differences between groups, adding the +/-1 standard deviation ranges highlights the groups' substantial overlap.

In addition to the comparison of means, multiple regression analysis was conducted in order to further explore the relationship between subgroup membership and KCCT performance. In nearly all instances, students' subgroup membership added to the prediction of their KCCT scale score, and the direction of these relationships reflected patterns depicted graphically. Students' gender, ethnic, disability and socioeconomic status do have an impact on performance on assessments such as the KCCT. This paper calls for further exploration of these gaps in student performance through the replication and expansion of these analyses for subsequent testing years.

Trends Between Student Gender, SES, Ethnicity, LEP, Disabilities and KCCT Performance
2003
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Background

Educational and psychological researchers have been interested in gaps within student achievement for several decades. Numerous studies have explored differences in student test scores as either an outgrowth of innate cognitive differences or as a reflection of social inequality (Herrnstein & Murray, 1994; Wilson, 1987). Regardless of the theoretical underpinnings, tracking gaps in student achievement serves a practical purpose for state and local public school systems that are serving increasingly diverse student populations and working to maintain compliance with federal legislation such as No Child Left Behind (NCLB). In order to ensure that all children are receiving the best possible education, it is important to look at how various social, cultural, and economic groups fare compared to one another, whether differences between the groups reflect differences on other measures of achievement, and whether these differences are maintained over time.

Since 1999, Kentucky schools have administered the Kentucky Core Content Test (KCCT) as a means of measuring school-level progress and compliance with the state's accountability system, the Commonwealth Accountability Testing System (CATS). Tests are administered to 4th and 5th grades in elementary, 7th and 8th grades in middle, and 10th, 11th and 12th grades in high school. Within these school-level testing blocks, different content areas are tested each year. For example, 4th grade students are tested in reading and science, while 5th grade students take math, social studies, arts & humanities and practical living tests. Educators, administrators and others sharing an interest in student achievement should be aware of how Kentucky students' KCCT scores reflect differences among students from various social, cultural and economic backgrounds. And, as increased efforts are made to reach groups of students that may have traditionally attained lower levels of achievement, it is also important to note changes in these achievement gaps over time.

NCLB has identified several student subgroups whose progress states and school districts are required to monitor (NCLB, 2003). These include gender groups, racial/ethnic groups, economically disadvantaged students, LEP students and students with disabilities. The student subgroups discussed in this report reflect the interests of NCLB.

Description of Data

Scale scores for students at each grade level, subject, and testing year were provided by the Kentucky Department of Education (KDE). Merged data files were generated using SAS v8.5, and then converted to Microsoft Excel 2002 files using DBMS Copy v7.0.3. Graphs for each content area/grade level combination were constructed in Microsoft Excel. The graphs presented are line graphs, each depicting mean scale scores for student subgroups for each of the four years (1999 through 2002). Points on the graphs represent the mean scale score for a given group during a given testing year, and the lines connecting the points represent change over time. Each point also has bars attached representing one standard deviation in both directions for the given group/year/subject combination. These bars should encompass roughly the center two-thirds of the

distribution of the data used to calculate the mean score. Each graph contains two or three lines, one for the student subgroup of interest, and the others representing a comparison group. KCCT scale scores range from 325 to 800.

Findings

All graphs reflect expected patterns in terms of gaps between student subgroups (based on subgroup performance on other state and national measures of achievement). Females score higher than males (with the exception of 4th and 11th grade science), Whites higher than African Americans, non-disabled students higher than students with disabilities, non-low income students higher than low income students, and non-LEP students higher than LEP students.

In addition to these anticipated findings, other interesting patterns can be observed. Within some content area/grade level combinations, student subgroups experienced steady gains over the four-year period, while others experienced a combination of gains and losses from year to year. Subgroups and the corresponding comparison groups typically experienced similar fluctuations in scores over time, with a few exceptions. Gaps between student subgroups have been largely maintained (gaps between subgroups have neither closed nor widened significantly).

This report makes note that certain groups have experienced either a narrowing or widening of the achievement gap over the four-year period, but none of these changes are large in magnitude. Across all of the subgroups, 79% of the changes in gap width are less than 5 scale score points (about 1/10th of a standard deviation) in either direction. Only within the non-LEP/LEP comparison was a large proportion (61%) more than 6 scale score points in either direction. None of the subgroup comparisons showed systematic gap changes in either direction. Also, the level of variation within each subgroup creates overlap between the scores of members of a particular group and members of the comparison group (for example, students with disabilities and students without disabilities). Some students with disabilities score higher than some students without disabilities, while the group as a whole experiences a gap in achievement.

Finally, multiple regression analysis confirmed that subgroup membership does add to the prediction of scale score. This analysis was conducted using school-level performance, so this methodology is a valid area of inquiry; however, because of the large variability within schools compared to the smaller variability between schools, initial R-square values were small. Adding subgroup membership data to this weak prediction resulted in weak improvements to its overall accuracy. Student-level comparison data was not available for most grade/subject combinations for this report because of Kentucky's testing schedule. Future analysis of this type will be able to utilize student-level scale scores from previous KCCT subject-specific tests, allowing for a more accurate understanding of the effects of subgroup membership on student achievement.

Disability Differences

Previous research indicates that students with disabilities tend to score lower on measures of achievement than students without disabilities (Thurlow, Elliot & Ysseldyke, 1998; Tindal, Heath, Hollenbeck, Almond, & Harniss, 1998; Koretz, 1997). The current research presents a similar pattern. Both non-disabled students and those with disabilities experienced similar changes in mean scale scores over the four-year period, and gaps between the groups remained fairly stable. There were a few exceptions, however, and changes in gaps ranged from -8.47 (8^{th} grade social studies) to +12.53 (11^{th} grade social studies). Eighty-three percent of the gap changes were 5 scale score points or less. Bars are included in each graph and represent one standard deviation above and below the mean scale score for each testing year. Student-level scores within each subgroup vary a great deal. Despite the mean differences depicted by the points on the graph, many individual students classified as disabled are clearly not low-performing.

Table 1 presents the proportion of students with and without disabilities for each testing year. By reading the table across rows, it becomes clear that the relative number of students in either disability subgroup has remained stable over the four-year period. Any large fluctuations in student mean scores are not attributable to changes in the proportion of students in a particular category. By reading down the columns, we can see that the proportion of students with disabilities decreases as we move through the grade levels. This could be an indication of students with disabilities eventually dropping out of school, or of differences in targeting students with disabilities at the different grade levels. Tables 2 through 7 present the means and standard deviations that are depicted in the graphs that follow.

Table 1. Proportion of Students With and Without Disabilities: 1999-2002

Grade		1999	2000	2001	2002
4^{th}	No Disabilities	42,309 (88%)	43,505 (88%)	44,235 (88%)	42,986 (88%)
	Disabilities	5,907 (12%)	5,661 (12%)	6,123 (12%)	5,889 (12%)
5^{th}	No Disabilities	40,891 (88%)	42,104 (87%)	43,308 (88%)	43,677 (88%)
	Disabilities	5,582 (12%)	6,023 (13%)	5,793 (12%)	6,112 (12%)
7^{th}	No Disabilities	42,239 (88%)	42,274 (88%)	41,740 (88%)	43,175 (88%)
	Disabilities	5,536 (12%)	5,540 (12%)	5,479 (12%)	5,676 (12%)
8^{th}	No Disabilities	43,672 (90%)	41,899 (89%)	41,854 (89%)	41,558 (89%)
	Disabilities	4,862 (10%)	5,189 (11%)	5,277 (11%)	5,397 (11%)
10^{th}	No Disabilities	42,501 (93%)	41,079 (93%)	41,971 (91%)	40,902 (91%)
	Disabilities	3,155 (7%)	3,149 (7%)	3,927 (9%)	3,978 (9%)
11^{th}	No Disabilities	38,131 (94%)	37,820 (94%)	36,417 (93%)	37,219 (93%)
	Disabilities	2,323 (6%)	2,487 (6%)	2,594 (7%)	2,941 (7%)

Table 2. Reading Means and Standard Deviations of Students with Disabilities (SWD) and Students Without Disabilities (ND) 1999-2002

	1999			2000			2001			2002	
	SWD	ND		SWD	ND		SWD	ND		SWD	ND
4th Grade											
Mean	522.85	547.45	Mean	523.09	548.46	Mean	512.52	547.51	Mean	527.88	550.89
S.D.	39.39	37.47	S.D.	37.43	34.86	S.D.	60.10	40.09	S.D.	36.41	33.73
7th Grade											
Mean	475.33	514.45	Mean	472.75	514.52	Mean	477.02	516.44	Mean	480.33	517.27
S.D.	35.23	34.67	S.D.	31.99	33.17	S.D.	32.35	31.62	S.D.	31.62	31.92
10th Grade											
Mean	425.19	500.98	Mean	431.10	508.11	Mean	425.71	509.27	Mean	433.16	509.59
S.D.	49.16	54.95	S.D.	49.39	54.61	S.D.	54.40	57.71	S.D.	49.76	54.52

Table 3. Science Means and Standard Deviations of Students with Disabilities (SWD) and Students Without Disabilities (ND) 1999-2002

	1999			2000			2001			2002	
	SWD	ND		SWD	ND		SWD	ND		SWD	ND
4th Grade											
Mean	519.69	540.55	Mean	521.98	543.66	Mean	513.88	545.57	Mean	528.26	548.31
S.D.	39.93	33.83	S.D.	39.19	31.24	S.D.	61.51	37.68	S.D.	37.13	29.99
7th Grade											
Mean	466.24	500.84	Mean	465.26	502.08	Mean	467.82	503.61	Mean	471.81	506.00
S.D.	40.72	31.00	S.D.	40.46	31.07	S.D.	38.98	30.60	S.D.	39.29	31.26
11th Grade											
Mean	482.89	537.99	Mean	484.28	539.81	Mean	488.80	542.72	Mean	491.35	545.81
S.D.	57.25	42.84	S.D.	58.86	42.83	S.D.	54.83	39.35	S.D.	53.07	39.16

Table 4. Math Means and Standard Deviations of Students with Disabilities (SWD) and Students Without Disabilities (ND) 1999-2002

	1999			2000			2001			2002	
	SWD	ND		SWD	ND		SWD	ND		SWD	ND
5th Grade											
Mean	515.72	555.17	Mean	515.73	558.43	Mean	520.71	563.07	Mean	526.03	565.30
S.D.	51.84	41.35	S.D.	55.54	40.72	S.D.	51.67	40.55	S.D.	52.12	39.95
8th Grade											
Mean	474.20	528.78	Mean	478.09	533.20	Mean	482.99	536.42	Mean	485.02	535.66
S.D.	53.23	40.50	S.D.	51.40	38.05	S.D.	49.93	36.44	S.D.	51.68	35.78
11th Grade											
Mean	453.53	526.21	Mean	451.18	528.37	Mean	458.13	534.29	Mean	459.90	537.04
S.D.	67.74	52.98	S.D.	65.93	52.11	S.D.	61.15	48.11	S.D.	62.86	47.84

Table 5. Social Studies Means and Standard Deviations of Students with Disabilities (SWD) and Students Without Disabilities (ND) 1999-2002

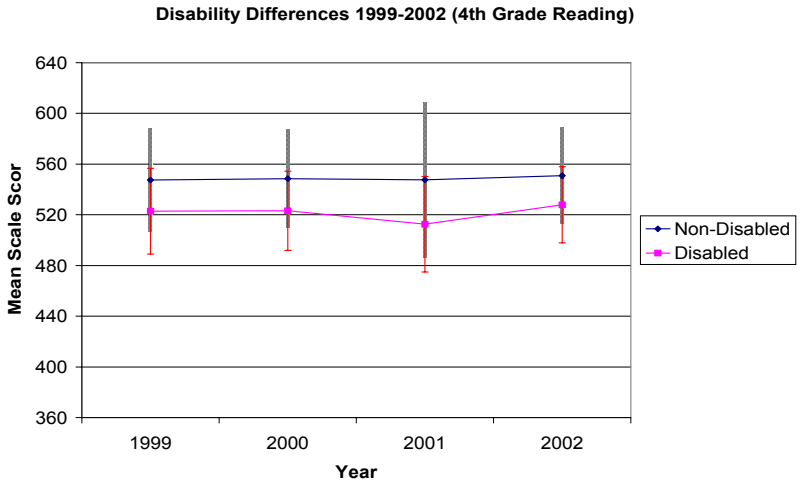
	1999			2000			2001			2002	
	SWD	ND		SWD	ND		SWD	ND		SWD	ND
5th Grade											
Mean	507.02	539.03	Mean	506.49	539.99	Mean	507.61	541.33	Mean	512.91	543.77
S.D.	41.67	35.89	S.D.	41.65	35.35	S.D.	42.17	35.24	S.D.	41.13	34.49
8th Grade											
Mean	453.00	508.68	Mean	458.25	513.74	Mean	458.99	518.48	Mean	463.78	519.23
S.D.	44.56	42.03	S.D.	44.16	43.38	S.D.	43.73	44.09	S.D.	41.86	43.43
11th Grade											
Mean	467.88	541.39	Mean	465.75	543.44	Mean	469.41	546.61	Mean	473.14	552.94
S.D.	61.93	54.33	S.D.	61.40	54.92	S.D.	55.30	54.36	S.D.	54.60	56.57

Table 6. Arts & Humanities Means and Standard Deviations of Students with Disabilities (SWD) and Students Without Disabilities (ND) 1999-2002

	1999			2000			2001			2002	
	SWD	ND		SWD	ND		SWD	ND		SWD	ND
5th Grade											
Mean	457.04	507.19	Mean	461.15	512.28	Mean	469.67	516.15	Mean	478.94	525.48
S.D.	63.26	68.00	S.D.	66.02	66.64	S.D.	59.31	60.29	S.D.	62.02	65.98
8th Grade											
Mean	441.35	507.29	Mean	445.52	516.32	Mean	447.98	519.47	Mean	451.76	520.63
S.D.	51.63	62.31	S.D.	57.63	62.68	S.D.	56.26	61.45	S.D.	54.37	62.51
11th Grade											
Mean	434.29	502.87	Mean	436.22	509.02	Mean	443.39	519.39	Mean	447.20	529.31
S.D.	56.00	63.98	S.D.	60.44	64.66	S.D.	59.31	64.78	S.D.	61.93	67.15

Table 7. Practical Living Means and Standard Deviations of Students with Disabilities (SWD) and Students Without Disabilities (ND) 1999-2002

	1999			2000			2001			2002	
	SWD	ND		SWD	ND		SWD	ND		SWD	ND
5th Grade											
Mean	458.10	506.04	Mean	458.84	506.97	Mean	461.24	511.18	Mean	469.50	513.63
S.D.	69.79	67.18	S.D.	68.54	66.41	S.D.	67.99	68.32	S.D.	65.45	63.63
8th Grade											
Mean	440.59	507.55	Mean	442.88	508.10	Mean	444.45	510.20	Mean	451.38	509.87
S.D.	55.15	62.81	S.D.	54.19	59.76	S.D.	53.12	57.38	S.D.	49.29	57.37
10th Grade											
Mean	430.04	504.59	Mean	435.07	507.25	Mean	426.09	506.13	Mean	436.15	509.25
S.D.	57.91	64.50	S.D.	57.35	62.24	S.D.	61.70	63.07	S.D.	57.42	61.18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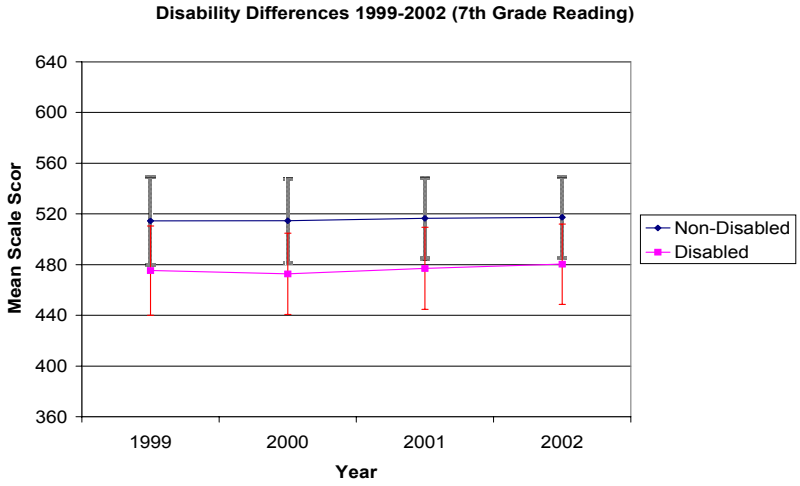
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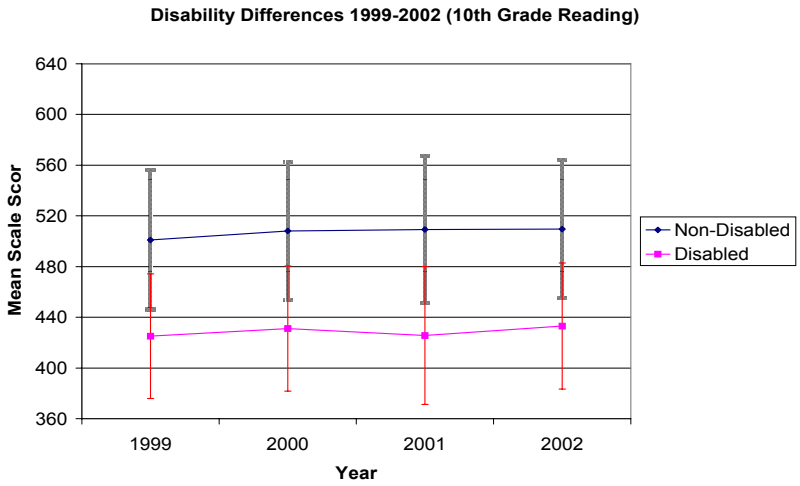
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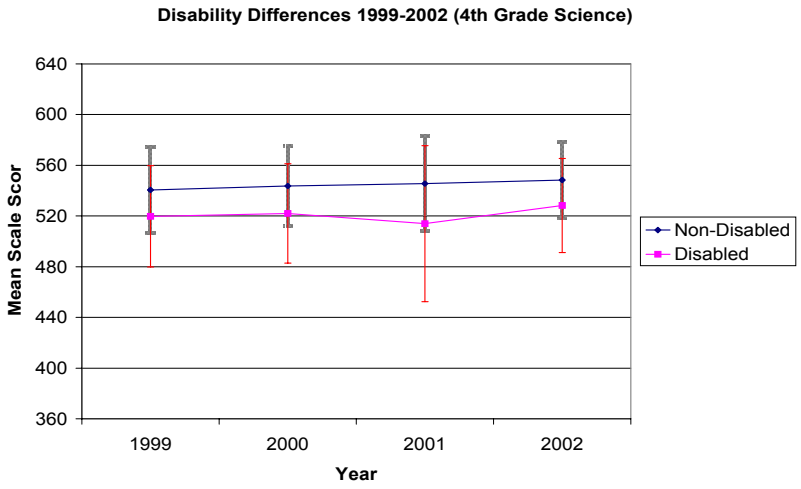
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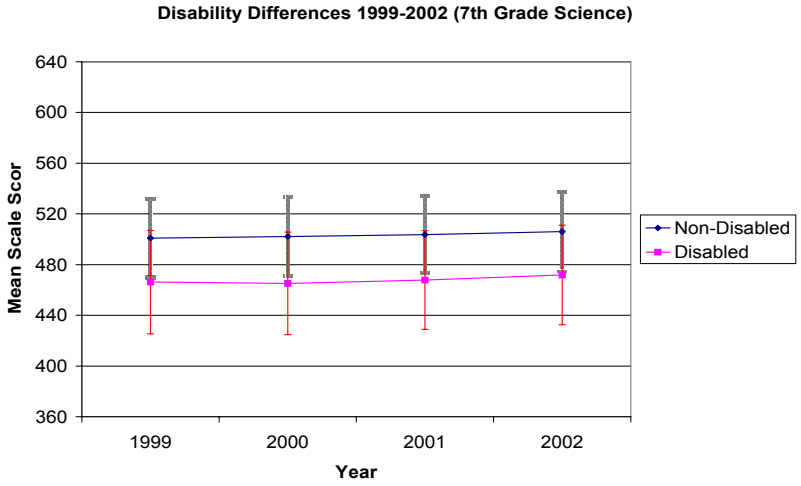
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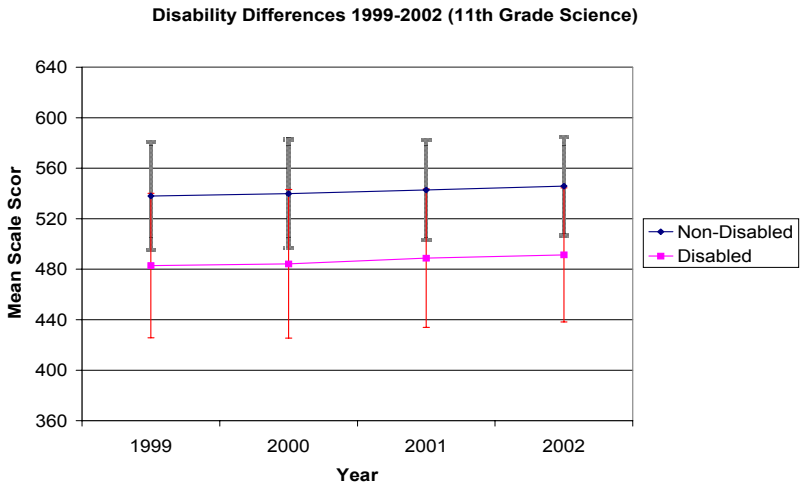
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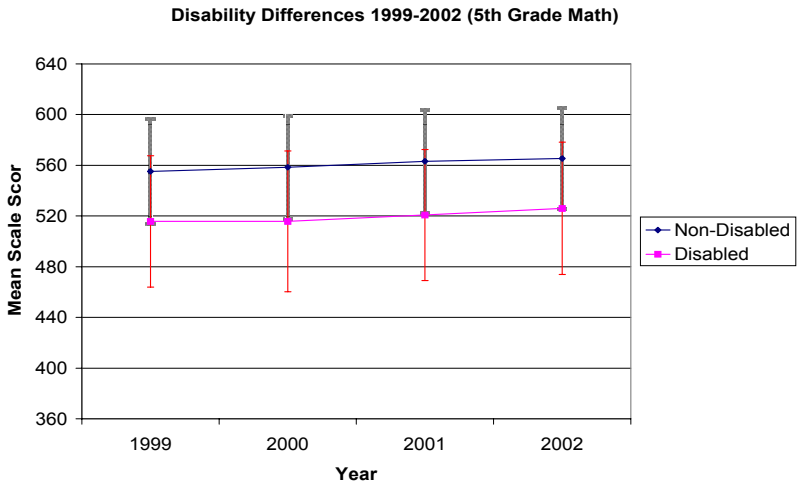
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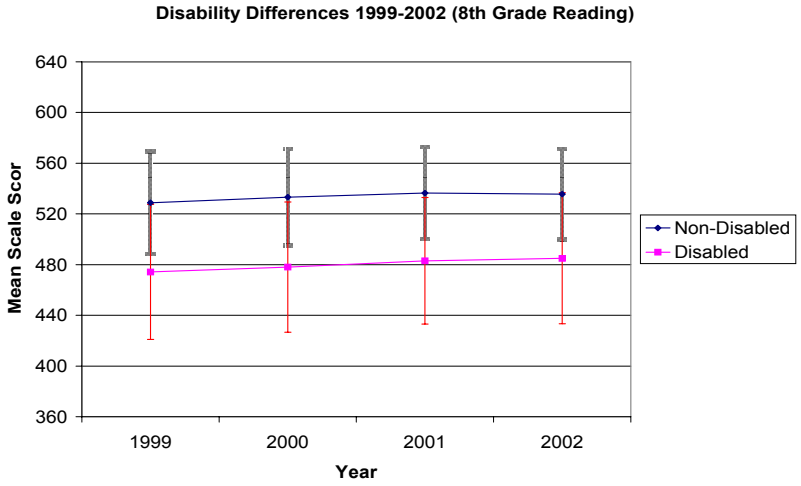
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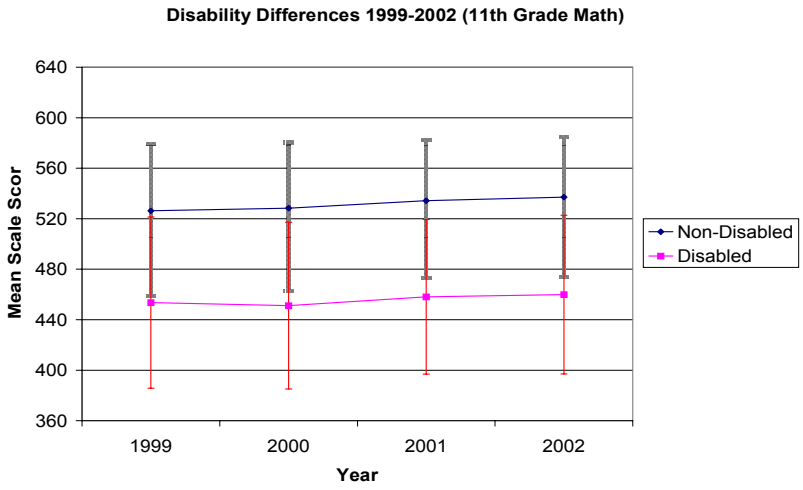
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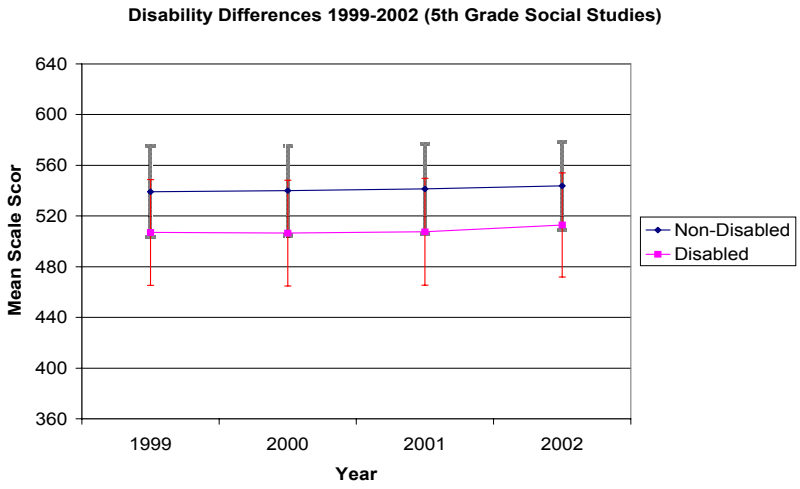
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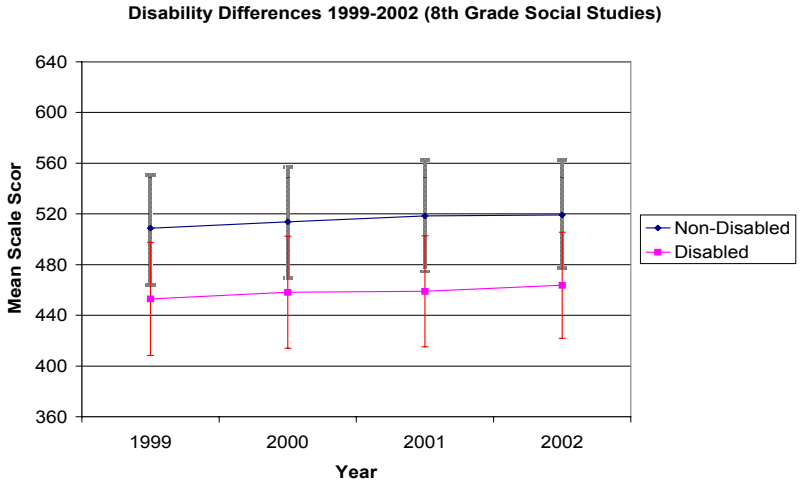
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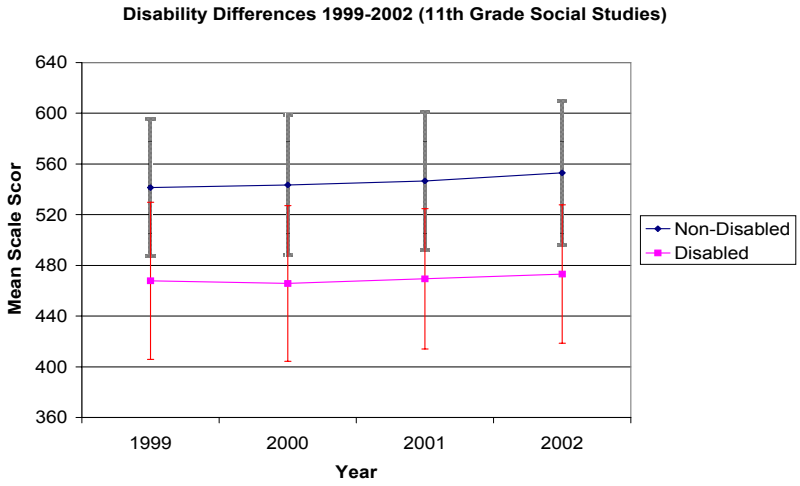
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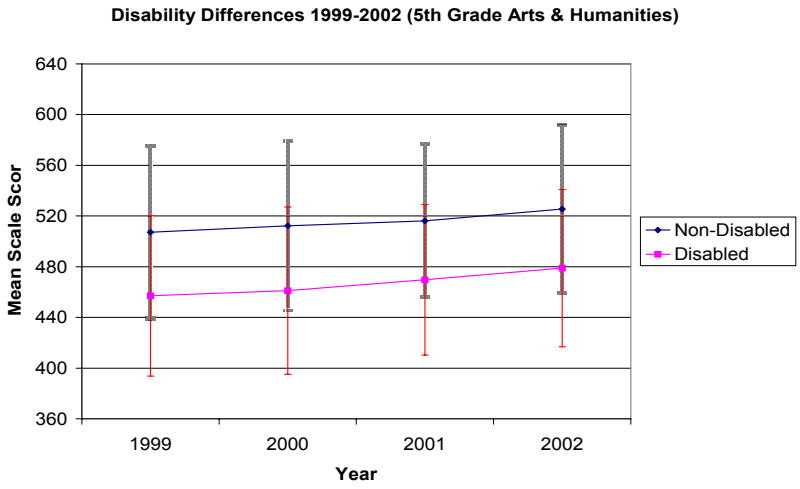
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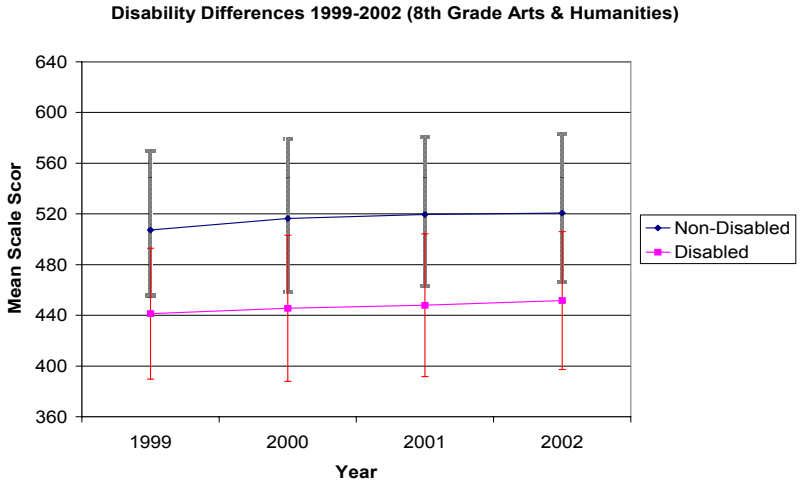
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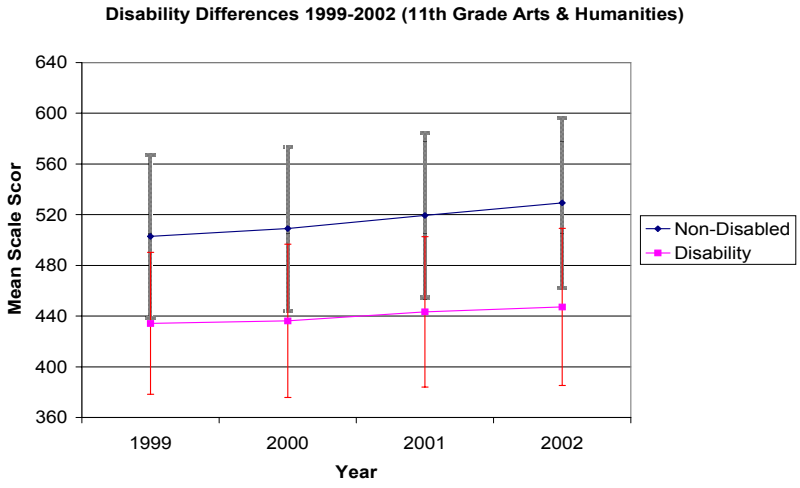
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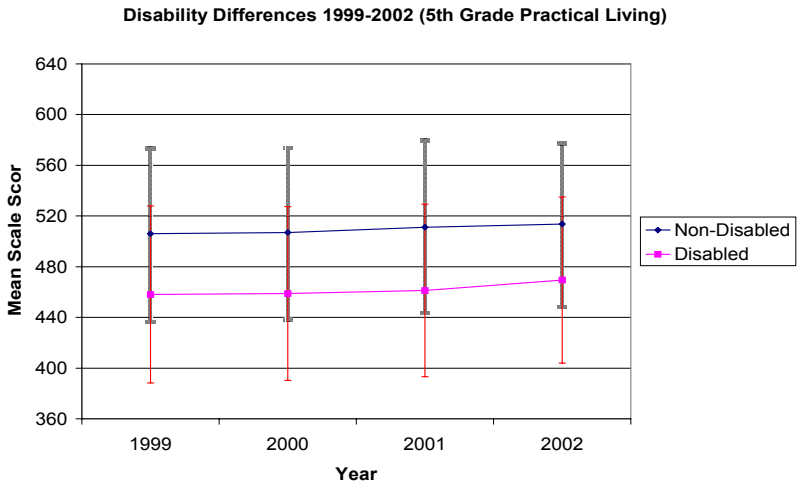
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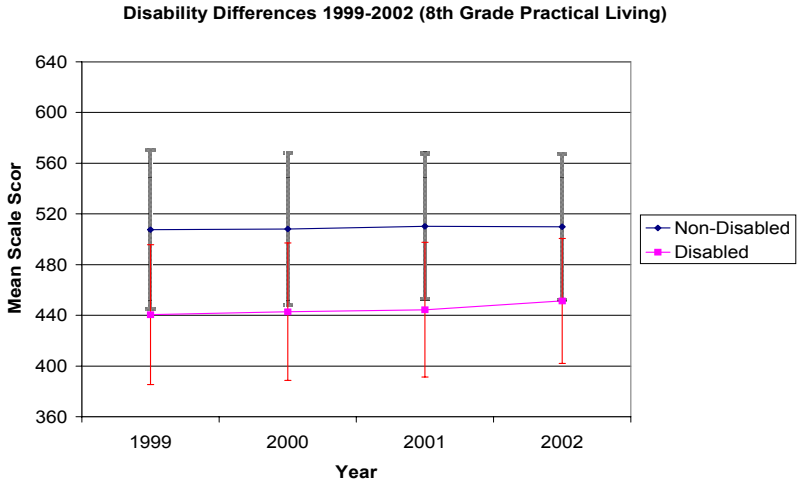
Disability Differences 1999-2002 (8th Grade Practical Living)
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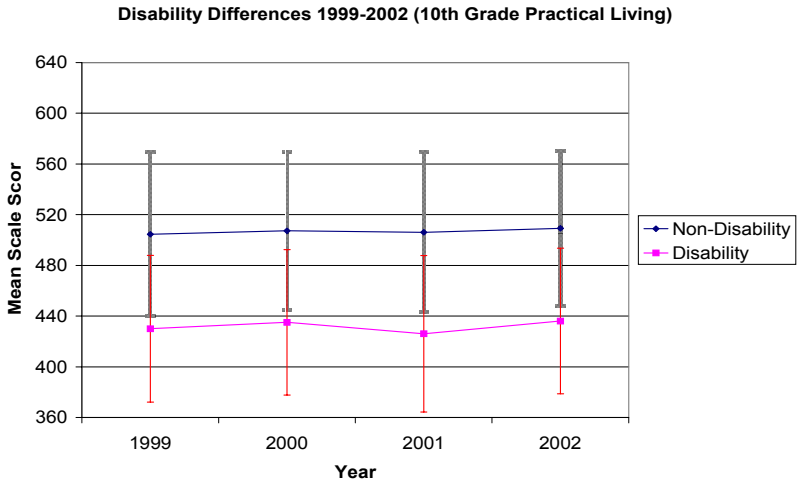
600
560
520
480
440
400
360
Mean Scale Scor
1999
2000
2001
2002
Year
Non-Disabled
Disabled


Disability Differences 1999-2002 (10th Grade Practical Living)
640
600
560
520
480
440
400
360
Mean Scale Scor
1999
2000
2001
2002
Year
Non-Disability
Disability

Ethnicity Differences

Previous research has found that White students tend to score higher on measures of achievement than both African American and Hispanic students (Bacci, Koger, Hoffman, & Thacker, 2003; Camara & Schmidt, 1999; Barton, 2001; Thacker & Hoffman, 1999). The current research reflects these trends across all content area/grade level combinations. Whites typically scored higher than African Americans and Hispanics. Changes in mean scale scores among Whites and African Americans typically followed the same pattern. Hispanic students experienced more fluctuation in mean scale scores, but their population is only 1% of the total, or about 500 students per grade. Bars represent one standard deviation above and below the mean scale score for each testing year. Again, it is clear that while gaps in mean achievement do exist, individual students from all ethnic groups are represented throughout the range of possible KCCT scores.

Table 8 presents the proportion of students in the three ethnicity categories for the four KCCT administrations. The relative number of students in each subgroup has remained stable. Tables 9 through 14 present the means and standard deviations depicted in the graphs that follow.

Table 8. Proportion of White, African American and Hispanic Students: 1999-2002

Grade		1999	2000	2001	2002
4th	White	41,669 (86%)	42,457 (86%)	43,002 (85%)	41,694 (85%)
	African American	5,091 (11%)	5,176 (11%)	5,515 (11%)	5,498 (11%)
	Hispanic	498 (1%)	497 (1%)	666 (1%)	596 (1%)
5th	White	40,514 (87%)	41,598 (86%)	42,456 (86%)	42,738 (86%)
	African American	4,688 (10%)	5,019 (10%)	5,019 (10%)	5,492 (11%)
	Hispanic	466 (1%)	529 (1%)	529 (1%)	594 (1%)
7th	White	41,763 (87%)	41,902 (88%)	41,028 (88%)	42,108 (86%)
	African American	4,722 (10%)	4,605 (10%)	4,806 (10%)	5,129 (10%)
	Hispanic	485 (1%)	501 (1%)	549 (1%)	615 (1%)
8th	White	42,860 (88%)	41,216 (88%)	41,202 (87%)	40,785 (87%)
	African American	4,389 (9%)	4,591 (10%)	4,529 (10%)	4,725 (10%)
	Hispanic	502 (1%)	511 (1%)	544 (1%)	547(1%)
10th	White	40,053 (88%)	38,905 (88%)	40,096 (87%)	39,182 (87%)
	African American	4,155 (9%)	3,952 (9%)	4,139 (9%)	4,272 (10%)
	Hispanic	586 (1%)	576 (1%)	667 (1%)	535 (1%)
11th	White	35,861 (89%)	35,599 (88%)	34,372 (88%)	35,564 (89%)
	African American	3,332 (8%)	3,500 (9%)	3,391 (9%)	3,339 (8%)
	Hispanic	544 (1%)	493 (1%)	548 (1%)	479 (1%)

Table 9. Reading Means and Standard Deviations of African American (AA), Hispanic (H), and White (W) Students 1999-2002

	1999				2000				2001				2002		
	AA	H	W		AA	H	W		AA	H	W		AA	H	W
4th															
Mean	538.68	535.86	547.04	Mean	542.14	539.61	547.79	Mean	528.40	492.00	546.66	Mean	546.78	538.37	550.40
S.D.	38.43	42.81	37.52	S.D.	39.43	34.87	35.42	S.D.	65.92	93.70	41.45	S.D.	35.02	39.65	34.07
7th															
Mean	512.39	506.43	512.01	Mean	505.51	503.31	511.79	Mean	512.11	508.81	514.04	Mean	510.49	502.73	515.17
S.D.	33.90	34.88	36.19	S.D.	39.75	36.71	34.61	S.D.	36.14	37.82	33.01	S.D.	35.68	43.16	33.04
10th															
Mean	495.54	484.59	498.91	Mean	501.19	495.67	505.26	Mean	483.58	469.96	505.75	Mean	502.15	494.80	505.58
S.D.	60.09	57.37	56.59	S.D.	59.80	58.19	56.93	S.D.	79.03	82.03	60.18	S.D.	59.98	59.04	57.68

Table 10. Science Means and Standard Deviations of African American (AA), Hispanic (H), and White (W) Students 1999-2002

	1999				2000				2001				2002		
	AA	H	W		AA	H	W		AA	H	W		AA	H	W
4th															
Mean	531.86	529.09	540.85	Mean	535.01	533.22	543.81	Mean	526.30	489.36	545.43	Mean	542.69	534.29	548.50
S.D.	35.17	40.26	33.90	S.D.	36.94	30.42	31.74	S.D.	65.00	91.47	39.07	S.D.	32.55	38.41	30.19
7th															
Mean	499.70	492.74	499.32	Mean	492.79	492.33	500.42	Mean	498.76	494.06	502.13	Mean	498.21	489.76	504.86
S.D.	30.80	34.50	32.72	S.D.	38.33	33.60	32.63	S.D.	33.95	34.91	31.95	S.D.	33.40	42.66	32.51
11th															
Mean	533.61	524.23	537.61	Mean	537.02	526.80	539.20	Mean	540.62	530.81	541.76	Mean	535.89	533.21	544.67
S.D.	47.47	52.84	43.25	S.D.	49.09	47.00	43.99	S.D.	46.61	47.61	40.64	S.D.	50.52	48.67	40.50

Table 11. Math Means and Standard Deviations of African American (AA), Hispanic (H), and White (W) Students 1999-2002

	1999				2000				2001				2002		
	AA	H	W		AA	H	W		AA	H	W		AA	H	W
5th															
Mean	547.51	544.60	553.03	Mean	548.09	542.23	556.08	Mean	552.80	546.87	560.98	Mean	556.97	553.94	563.17
S.D.	42.02	47.50	43.70	S.D.	48.49	51.19	43.88	S.D.	50.07	53.63	43.17	S.D.	46.70	42.63	42.88
8th															
Mean	520.03	516.54	526.31	Mean	527.07	524.36	530.10	Mean	528.15	524.29	533.35	Mean	526.79	521.11	532.56
S.D.	43.26	46.61	43.24	S.D.	41.32	41.53	41.62	S.D.	46.27	37.72	40.02	S.D.	40.53	44.34	39.83
11th															
Mean	519.69	515.83	525.27	Mean	524.56	504.05	527.14	Mean	530.74	519.54	532.30	Mean	522.30	521.16	534.49
S.D.	62.92	59.42	54.19	S.D.	52.99	68.90	53.82	S.D.	56.07	56.79	50.59	S.D.	55.62	55.62	51.06

Table 12. Social Studies Means and Standard Deviations of African American (AA), Hispanic (H) and White (W) Students 1999-2002

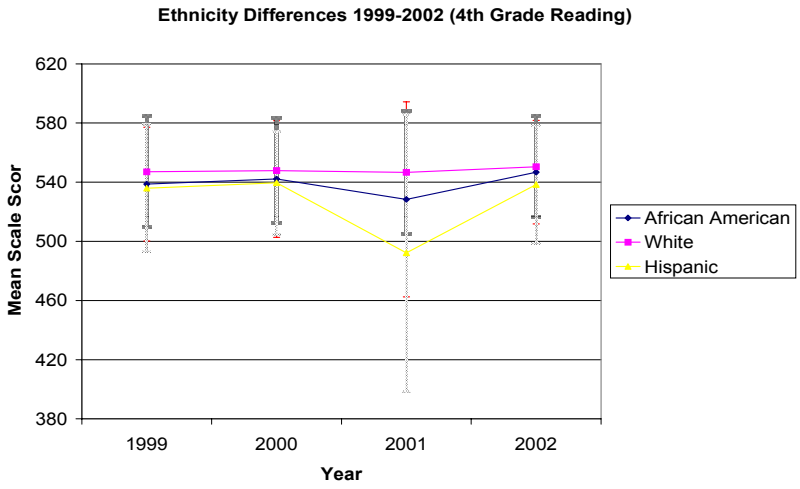
	1999				2000				2001				2002		
	AA	H	W		AA	H	W		AA	H	W		AA	H	W
5th															
Mean	528.83	528.69	537.43	Mean	531.47	525.63	538.27	Mean	534.56	528.32	539.67	Mean	537.01	533.63	542.37
S.D.	39.43	37.60	37.39	S.D.	39.02	44.42	36.99	S.D.	43.21	45.33	37.05	S.D.	36.20	37.42	36.24
8th															
Mean	501.37	496.02	505.78	Mean	508.61	501.54	510.44	Mean	509.53	502.53	514.57	Mean	509.02	503.88	515.58
S.D.	45.07	49.75	44.26	S.D.	46.33	43.57	45.86	S.D.	52.42	47.87	46.92	S.D.	46.31	46.00	45.89
11th															
Mean	536.92	532.09	539.85	Mean	541.55	527.11	541.49	Mean	543.96	527.67	544.15	Mean	541.39	538.29	549.92
S.D.	60.29	56.78	55.66	S.D.	57.72	58.64	57.00	S.D.	62.04	65.79	56.26	S.D.	65.46	65.82	58.79

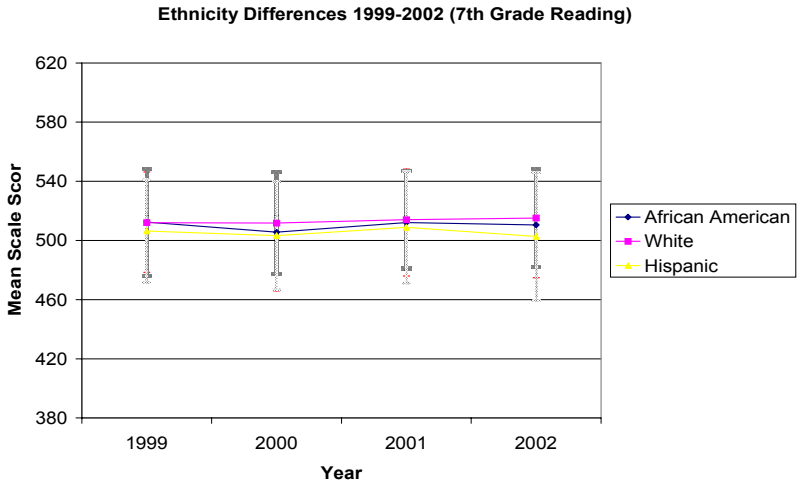
Table 13. Arts & Humanities Means and Standard Deviations of African American (AA), Hispanic (H), and White (W) Students 1999-2002

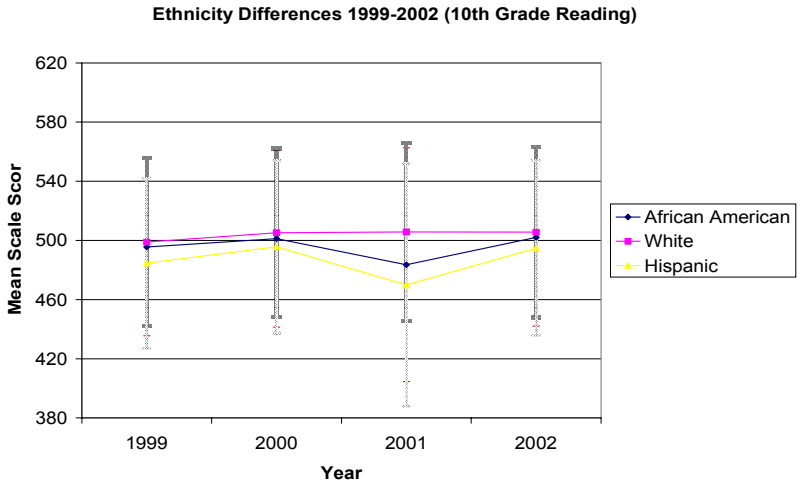
	1999				2000				2001				2002		
	AA	H	W		AA	H	W		AA	H	W		AA	H	W
5th															
Mean	497.50	486.55	504.57	Mean	503.02	490.15	509.66	Mean	507.77	497.37	513.98	Mean	514.09	504.36	523.55
S.D.	71.08	64.70	69.18	S.D.	65.64	66.93	68.19	S.D.	63.52	61.51	61.80	S.D.	62.54	63.54	67.33
8th															
Mean	497.68	492.33	503.44	Mean	509.12	500.51	511.83	Mean	506.80	496.49	514.57	Mean	505.90	502.75	515.75
S.D.	66.10	68.43	64.16	S.D.	63.92	59.83	65.51	S.D.	65.73	63.81	64.35	S.D.	66.71	67.45	64.80
11th															
Mean	502.46	490.87	501.32	Mean	504.47	486.78	507.24	Mean	516.74	507.23	517.03	Mean	512.85	515.06	525.91
S.D.	63.72	67.52	64.91	S.D.	64.59	63.75	66.25	S.D.	69.95	70.49	66.31	S.D.	72.92	68.83	69.50

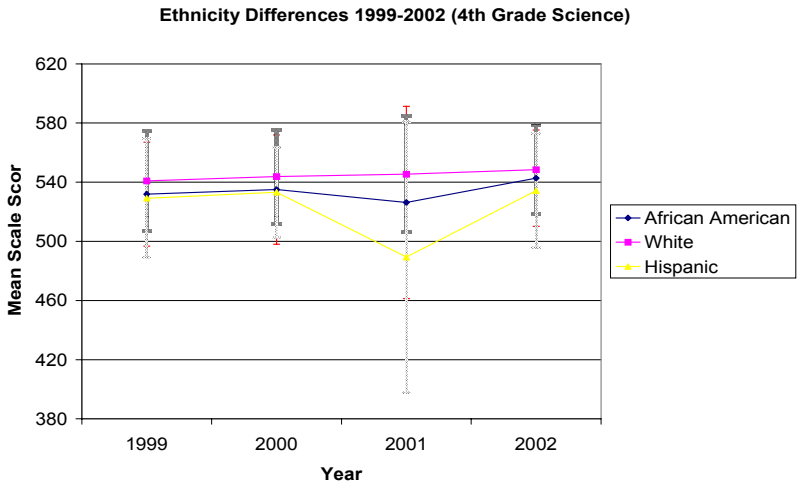
Table 14. Practical Living Means and Standard Deviations of African American (AA), Hispanic (H), and White (W) Students 1999-2002

	1999				2000				2001				2002		
	AA	H	W		AA	H	W		AA	H	W		AA	H	W
5th															
Mean	491.07	491.93	503.68	Mean	493.36	486.17	504.77	Mean	502.10	492.22	509.12	Mean	503.68	494.59	511.76
S.D.	66.57	64.77	68.86	S.D.	64.45	72.03	68.19	S.D.	74.65	72.33	69.66	S.D.	67.11	65.59	65.25
8th															
Mean	494.33	493.44	504.15	Mean	500.48	494.41	504.01	Mean	495.97	490.71	506.09	Mean	499.39	491.81	506.15
S.D.	72.38	72.92	64.34	S.D.	64.61	57.10	62.05	S.D.	64.63	56.57	59.88	S.D.	57.28	56.32	58.99
10th															
Mean	498.45	482.83	502.91	Mean	501.26	490.04	505.04	Mean	477.49	465.99	503.36	Mean	499.79	485.49	505.89
S.D.	68.33	70.35	65.53	S.D.	67.25	61.01	63.61	S.D.	83.42	86.93	65.06	S.D.	67.73	67.31	63.53


Ethnicity Differences 1999-2002 (4th Grade Reading)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (7th Grade Reading)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (10th Grade Reading)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (4th Grade Science)
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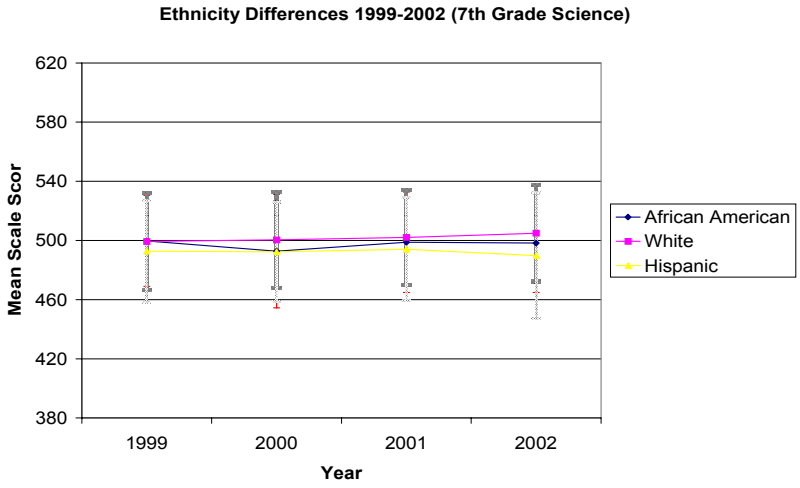
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (7th Grade Science)
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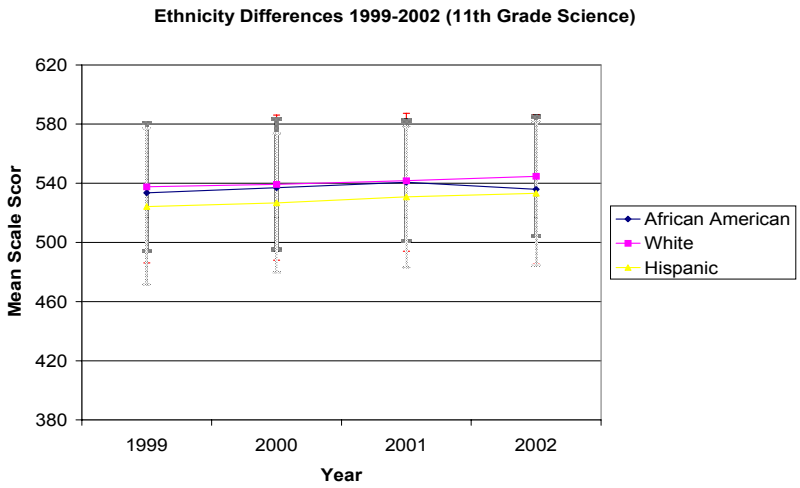
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (11th Grade Science)
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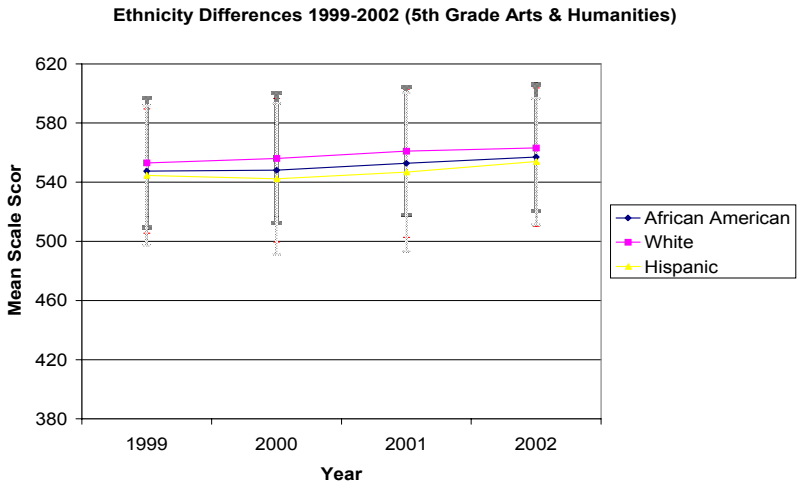
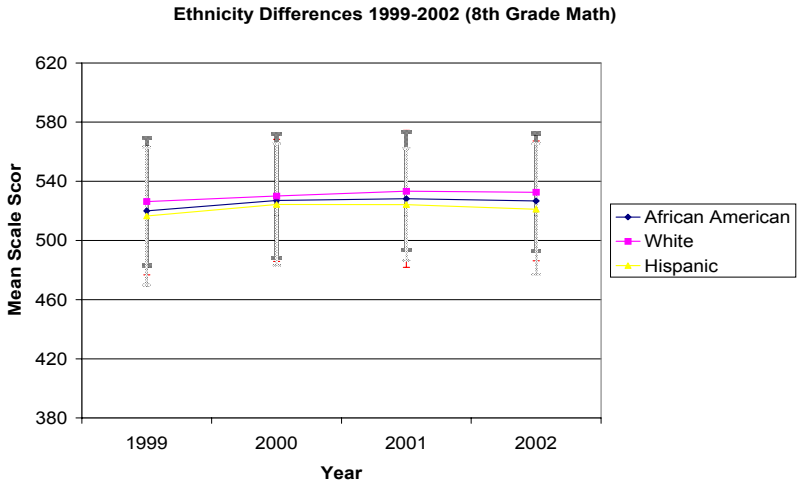
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (5th Grade Arts & Humanities)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (8th Grade Math)
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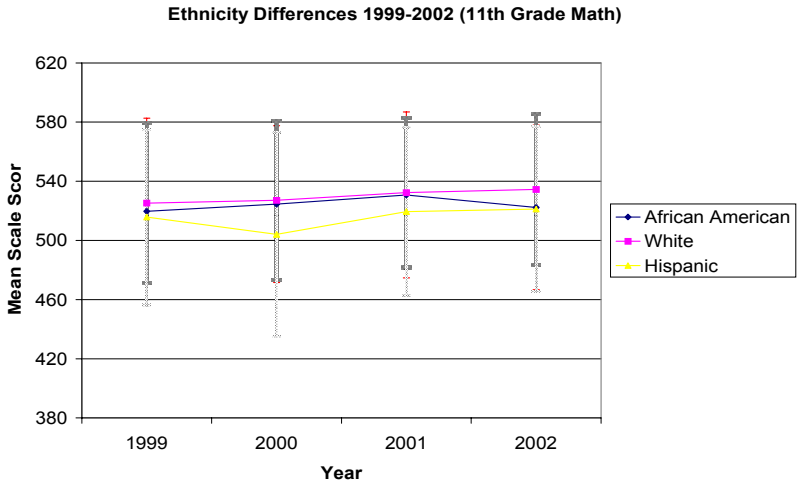
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (11th Grade Math)
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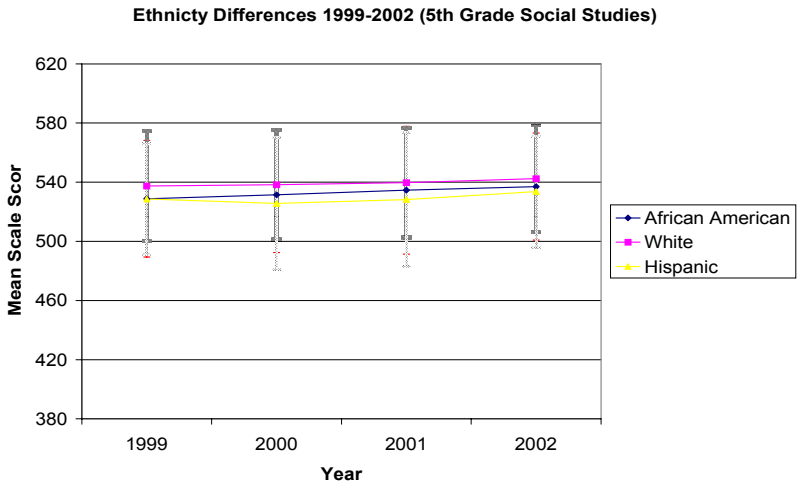
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicty Differences 1999-2002 (5th Grade Social Studies)
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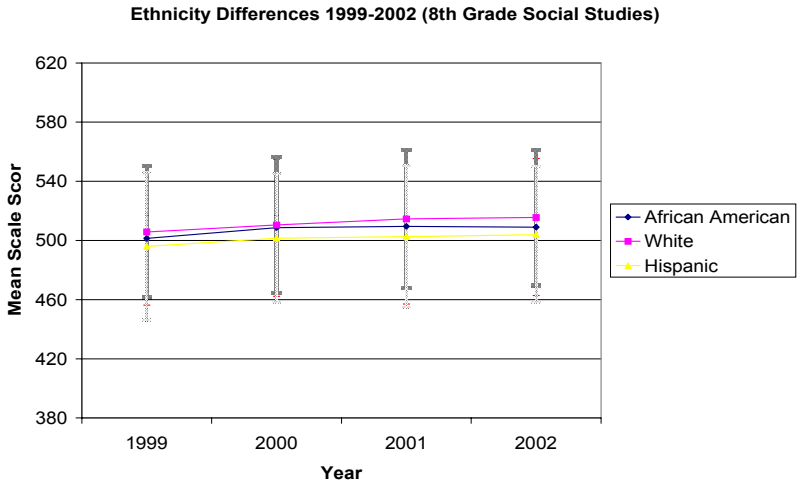
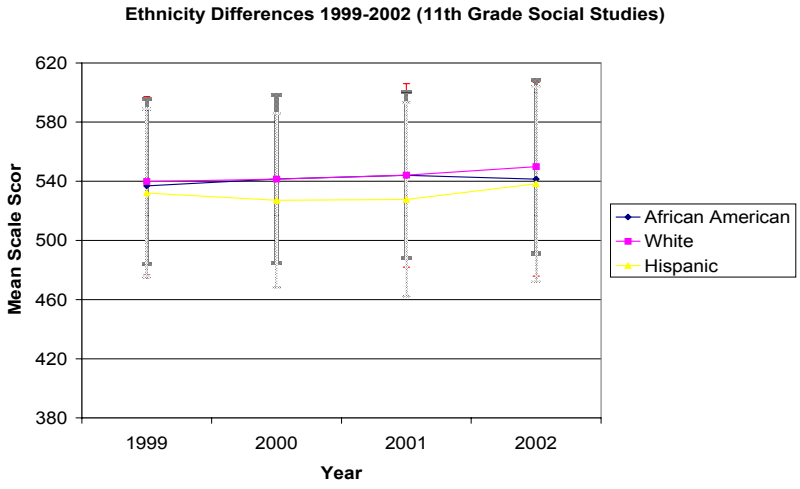
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (8th Grade Social Studies)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (11th Grade Social Studies)
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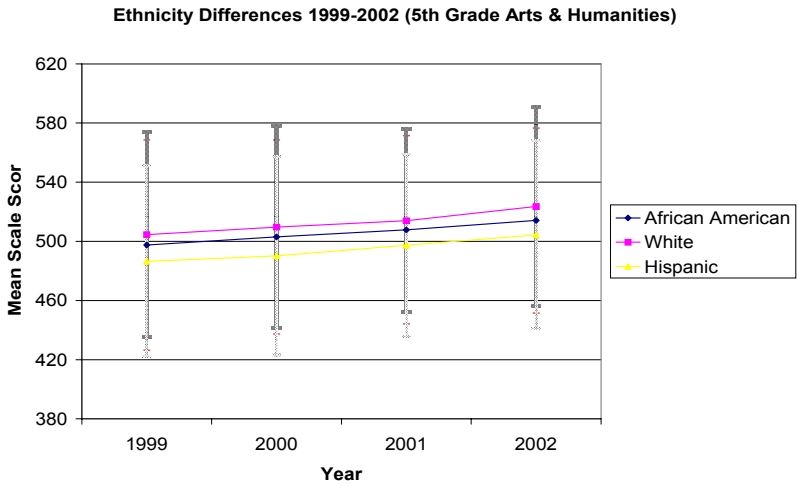
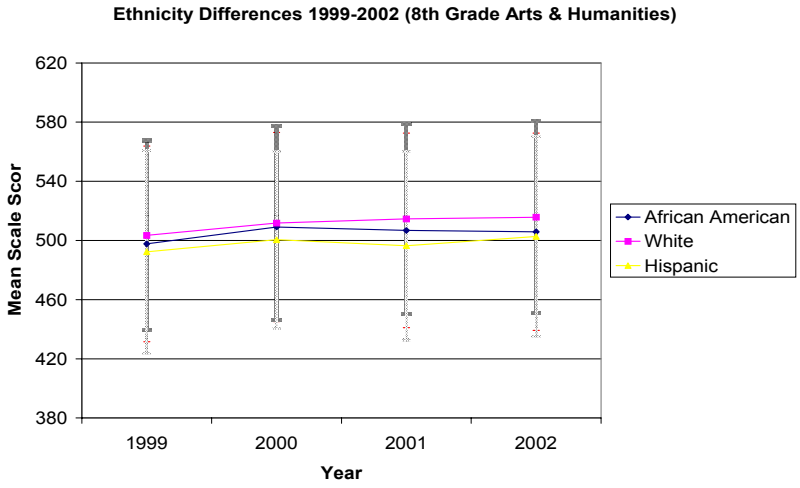
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (5th Grade Arts & Humanities)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (8th Grade Arts & Humanities)
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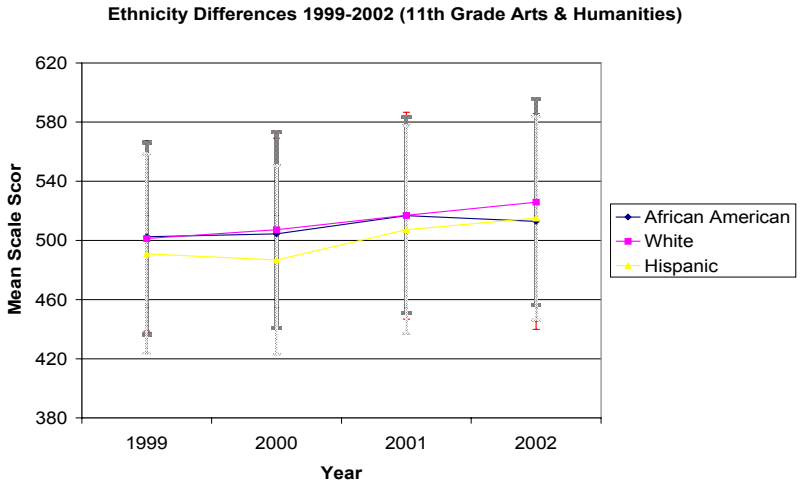
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (11th Grade Arts & Humanities)
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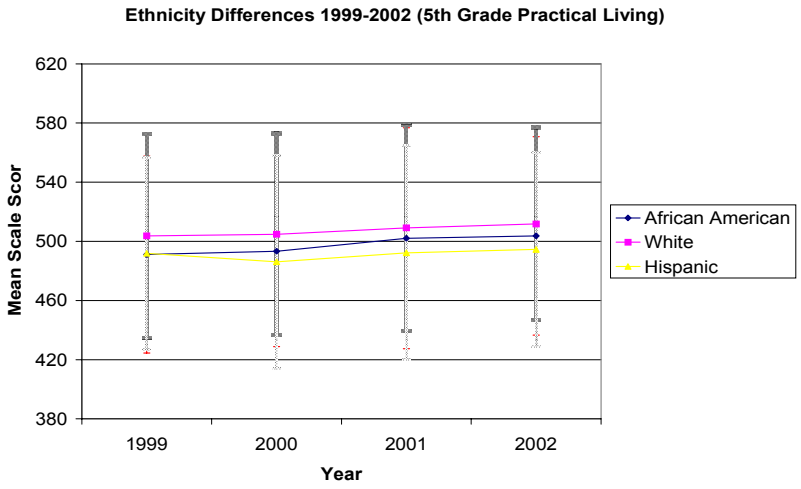
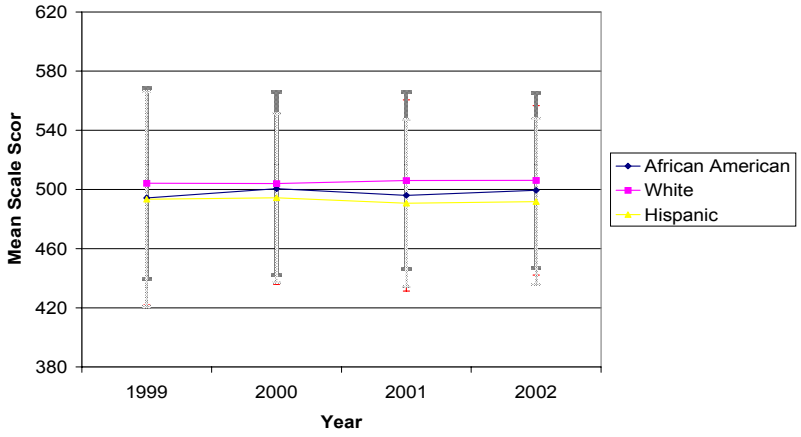
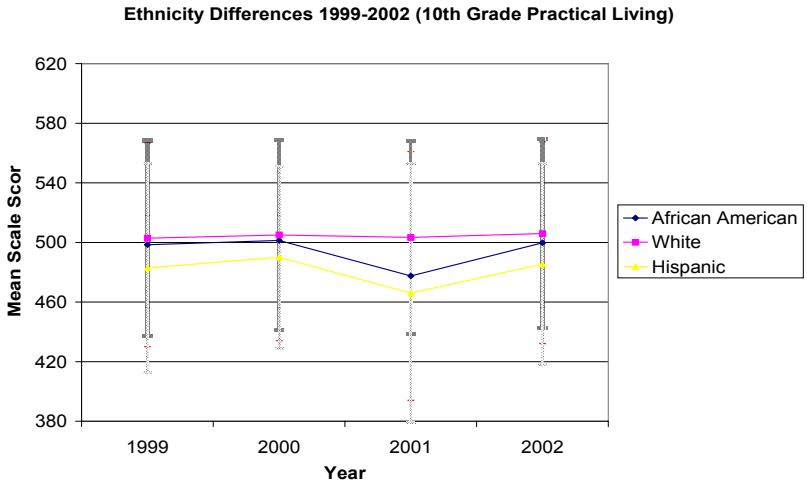
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (5th Grade Practical Living)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (8th Grade Practical Living)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic


Ethnicity Differences 1999-2002 (10th Grade Practical Living)
620
580
540
500
460
420
380
Mean Scale Scor
1999
2000
2001
2002
Year
African American
White
Hispanic

Gender Differences

Female students typically outscore male students on measures of academic achievement, especially in areas such as reading and writing, but with smaller gaps in the areas of math and science (AAUWEF, 1998; Willingham & Cole, 1997). Kentucky students' mean KCCT scale scores reflect this pattern, with a couple of exceptions. In the case of 4th grade students tested in science, males scored slightly higher than females in three of the four testing years. In 2002, 11th grade males scored higher than females, also on the science portion of the assessment. In each of these cases, males' and females' scores were essentially the same. Across the other content area/grade level combinations, females scored consistently higher than males, and the gaps between the two groups remained fairly stable. The largest changes in gaps between the two gender groupings occurred within 8th grade social studies (the gap widened by 4.95 scale score points) and 10th grade practical living (the gap narrowed by 4.24 scale score points). Again, bars are included in each graph and represent one standard deviation above and below the mean scale score for each testing year. Standard deviation bars indicate that both males and females score throughout the KCCT range.

Table 15 presents the proportion of students in each of the gender categories. As expected, the population is composed of nearly equal proportions of males and females, and this pattern remains stable over the four-year period. Tables 16 through 21 present the means and standard deviations depicted by the graphs that follow.

Table 15. Proportion of Male and Female Students for Each Grade Level: 1999-2002

Grade		1999	2000	2001	2002
4th	Male	24,922 (52%)	25,248 (51%)	25,770 (51%)	25,347 (52%)
	Female	23,294 (48%)	23,918 (49%)	24,588 (49%)	23,528 (48%)
5th	Male	23,846 (51%)	24,858 (52%)	25,227 (51%)	25,421 (51%)
	Female	22,627 (49%)	23,269 (48%)	23,874 (49%)	24,368 (49%)
7th	Male	24,796 (52%)	24,526 (51%)	24,318 (52%)	25,233 (52%)
	Female	22,979 (48%)	23,288 (49%)	22,901 (48%)	23,618 (48%)
8th	Male	25,218 (52%)	24,351 (52%)	24,137 (51%)	24,051 (51%)
	Female	23,316 (48%)	22,737 (48%)	22,994 (49%)	22,905 (49%)
10th	Male	23,279 (51%)	22,409 (51%)	23,663 (52%)	23,020 (51%)
	Female	22,377 (49%)	21,819 (49%)	22,235 (48%)	21,860 (49%)
11th	Male	19,919 (49%)	20,051 (50%)	19,212 (49%)	20,111 (50%)
	Female	20,535 (51%)	20,256 (50%)	19,799 (51%)	20,049 (50%)

Table 16. Reading Means and Standard Deviations of Male and Female Students 1999-2002

	1999			2000			2001			2002	
	Male	Female		Male	Female		Male	Female		Male	Female
4th Grade											
Mean	539.62	549.61	Mean	540.50	550.88	Mean	537.83	549.02	Mean	543.25	553.41
S.D.	38.41	38.04	S.D.	35.59	35.78	S.D.	44.69	43.45	S.D.	34.01	34.93
7th Grade											
Mean	502.25	518.26	Mean	502.33	517.48	Mean	504.73	519.59	Mean	505.71	520.85
S.D.	36.02	35.96	S.D.	35.05	34.52	S.D.	33.50	32.68	S.D.	33.33	32.69
10th Grade											
Mean	480.78	511.32	Mean	488.82	516.80	Mean	487.74	517.43	Mean	489.33	517.03
S.D.	58.12	53.28	S.D.	58.44	53.46	S.D.	61.68	58.60	S.D.	58.36	54.77

Table 17. Science Means and Standard Deviations of Male and Female Students 1999-2002

	1999			2000			2001			2002	
	Male	Female		Male	Female		Male	Female		Male	Female
4th Grade											
Mean	538.25	537.74	Mean	541.37	540.97	Mean	541.37	542.16	Mean	546.24	545.56
S.D.	36.17	34.33	S.D.	34.16	31.67	S.D.	44.20	40.70	S.D.	32.09	30.96
7th Grade											
Mean	496.08	497.69	Mean	497.30	498.39	Mean	499.04	500.06	Mean	501.85	502.33
S.D.	36.00	31.85	S.D.	36.13	32.38	S.D.	34.84	32.05	S.D.	35.01	32.83
11th Grade											
Mean	533.94	535.68	Mean	535.73	537.03	Mean	538.96	539.31	Mean	542.46	541.18
S.D.	48.75	42.38	S.D.	49.66	41.99	S.D.	45.56	39.79	S.D.	45.08	40.29

Table 18. Math Means and Standard Deviations of Male and Female Students 1999-2002

	1999		2000		2001			2002	
	Male	Female	Male	Female	Male	Female		Male	Female
5th Grade									
Mean	549.17	551.77	550.93	555.40	555.85	560.42	Mean	558.73	562.30
S.D.	46.10	42.99	46.48	43.51	45.37	42.76	S.D.	44.39	42.65
8th Grade									
Mean	521.29	525.51	524.83	529.58	528.46	532.52	Mean	527.75	532.04
S.D.	46.32	43.50	45.58	40.64	43.78	39.38	S.D.	43.15	39.02
11th Grade									
Mean	520.10	523.92	521.19	526.01	526.85	531.53	Mean	529.43	533.37
S.D.	60.53	52.29	59.35	52.83	56.45	48.51	S.D.	55.83	50.04

Table 19. Social Studies Means and Standard Deviations of Male and Female Students 1999-2002

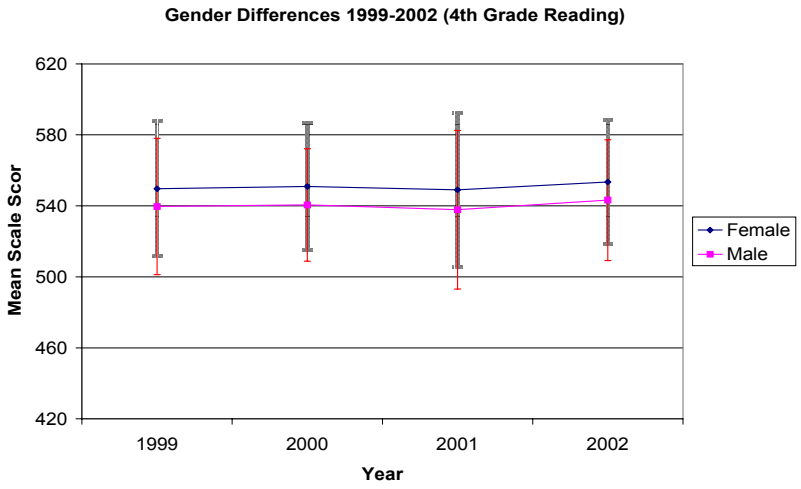
	1999		2000		2001			2002	
	Male	Female	Male	Female	Male	Female		Male	Female
5th Grade									
Mean	532.26	538.27	532.88	538.91	534.39	540.48	Mean	537.07	543.01
S.D.	38.24	37.68	37.90	37.57	37.65	37.57	S.D.	36.16	37.20
8th Grade									
Mean	498.78	507.78	502.19	513.45	506.22	517.70	Mean	506.05	520.00
S.D.	46.05	44.37	47.11	45.77	48.13	46.90	S.D.	46.25	46.15
11th Grade									
Mean	530.72	543.42	532.45	544.78	534.27	548.46	Mean	540.77	553.43
S.D.	59.65	54.41	60.96	55.10	59.61	54.93	S.D.	61.45	58.09

Table 20. Arts & Humanities and Standard Deviations of Male and Female Students 1999-2002

	1999			2000			2001			2002	
	Male	Female		Male	Female		Male	Female		Male	Female
5th Grade											
Mean	492.14	510.68	Mean	496.89	515.49	Mean	501.29	520.56	Mean	511.32	528.57
S.D.	66.49	71.09	S.D.	66.08	70.09	S.D.	58.65	63.90	S.D.	63.57	69.83
8th Grade											
Mean	487.75	514.68	Mean	496.58	521.30	Mean	499.07	524.48	Mean	499.36	526.73
S.D.	61.28	64.85	S.D.	64.26	65.40	S.D.	63.14	64.25	S.D.	61.59	66.40
11th Grade											
Mean	486.10	511.37	Mean	491.33	517.60	Mean	500.59	527.67	Mean	510.25	536.39
S.D.	64.64	63.96	S.D.	66.84	64.03	S.D.	66.74	64.83	S.D.	69.10	68.68

Table 21. Practical Living Means and Standard Deviations of Male and Female Students 1999-2002

	1999			2000			2001			2002	
	Male	Female		Male	Female		Male	Female		Male	Female
5th Grade											
Mean	492.47	508.51	Mean	492.95	509.50	Mean	497.10	513.94	Mean	499.97	516.81
S.D.	67.84	69.81	S.D.	66.39	69.79	S.D.	68.24	71.11	S.D.	63.07	66.83
8th Grade											
Mean	490.19	512.35	Mean	491.16	511.36	Mean	493.41	512.74	Mean	493.04	513.77
S.D.	63.20	65.50	S.D.	61.47	62.11	S.D.	59.53	60.08	S.D.	56.11	61.08
10th Grade											
Mean	486.27	513.15	Mean	490.11	514.45	Mean	487.04	512.31	Mean	491.74	514.38
S.D.	65.62	65.23	S.D.	64.65	62.23	S.D.	65.93	65.28	S.D.	63.94	62.61


Gender Differences 1999-2002 (4th Grade Reading)
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Mean Scale Scor
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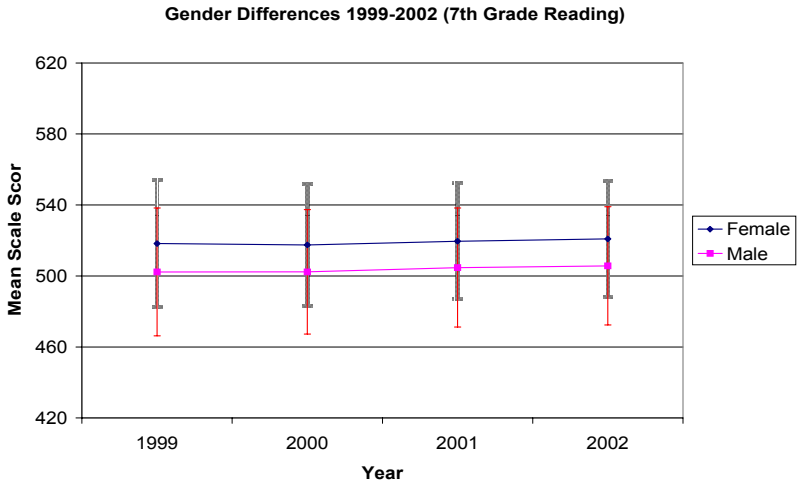
2002
Year
Female
Male


Gender Differences 1999-2002 (7th Grade Reading)
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460
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Mean Scale Scor
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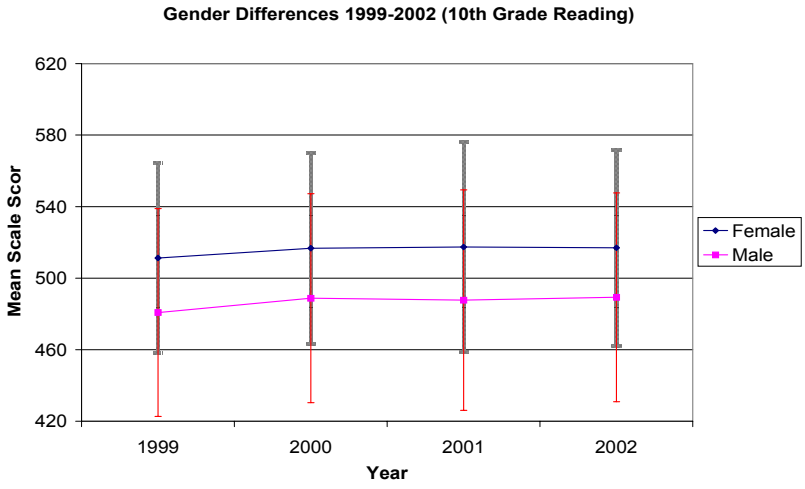
2001
2002
Year
Female
Male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Mean Scale Scor
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2001
2002
Year
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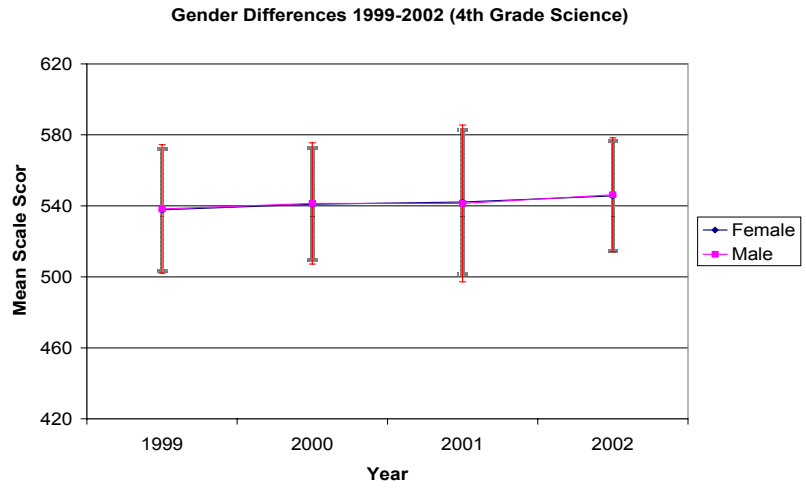
Male


Gender Differences 1999-2002 (4th Grade Science)
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500
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420
Mean Scale Scor
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Year
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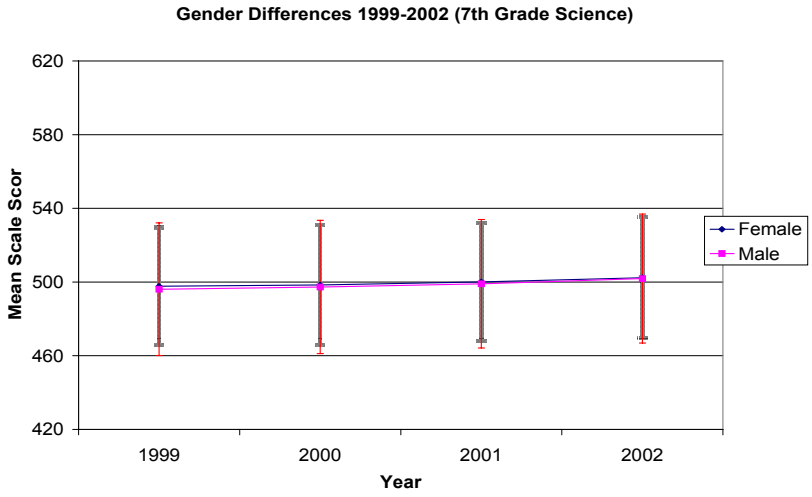
Male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Mean Scale Scor
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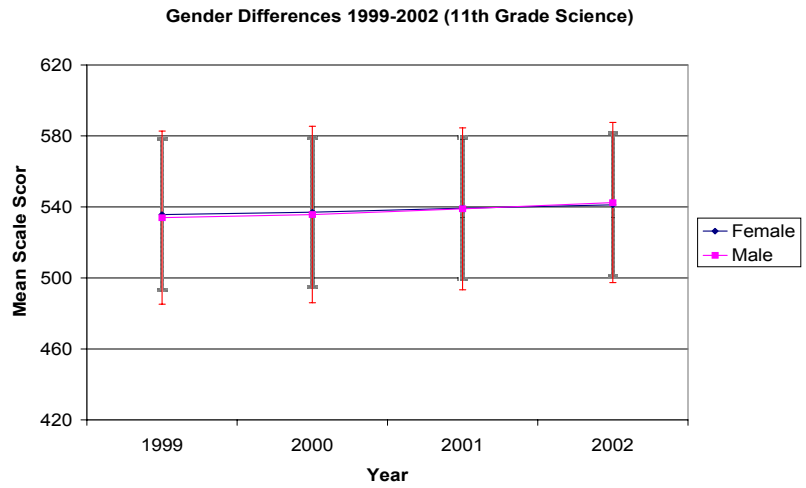
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500
460
420
Mean Scale Scor
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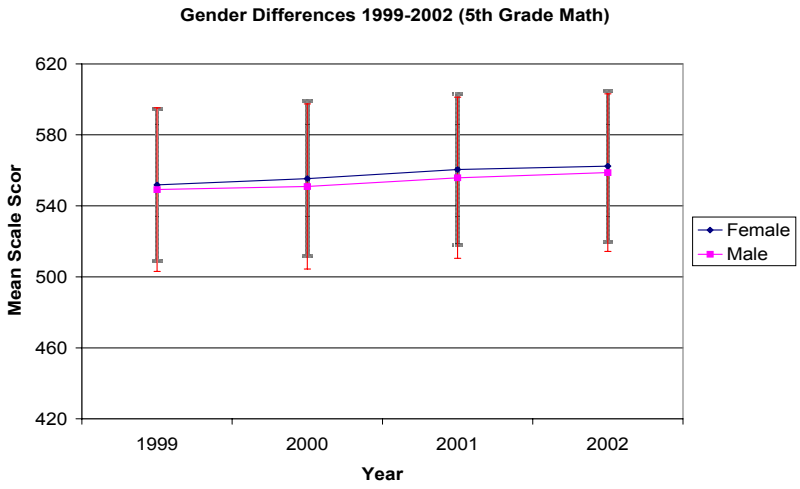
2002
Year
Female
Male


Gender Differences 1999-2002 (5th Grade Math)
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Mean Scale Scor
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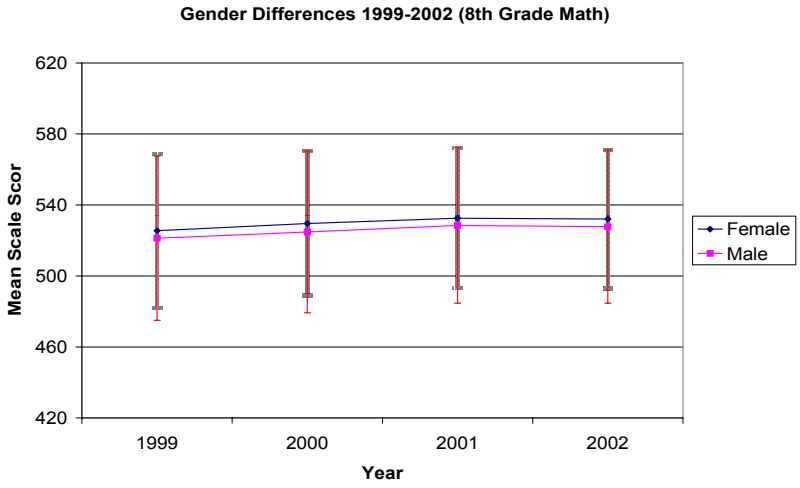
Male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Mean Scale Scor
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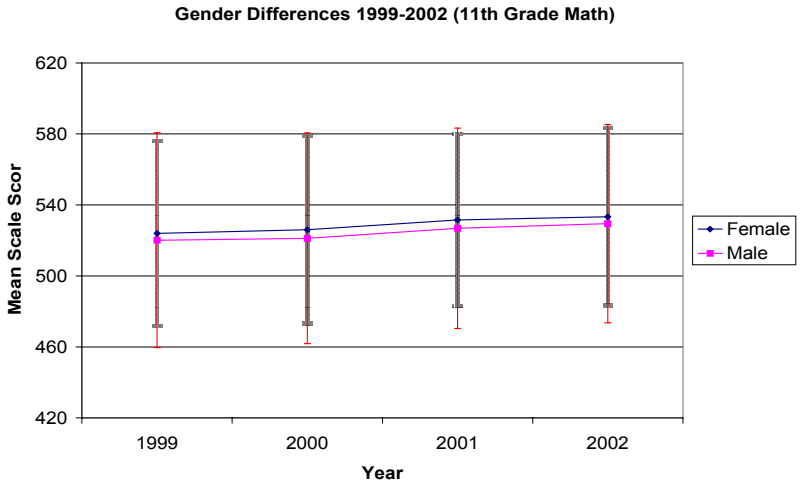
Year
Female
Male


Gender Differences 1999-2002 (11th Grade Math)
620
580
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500
460
420
Mean Scale Scor
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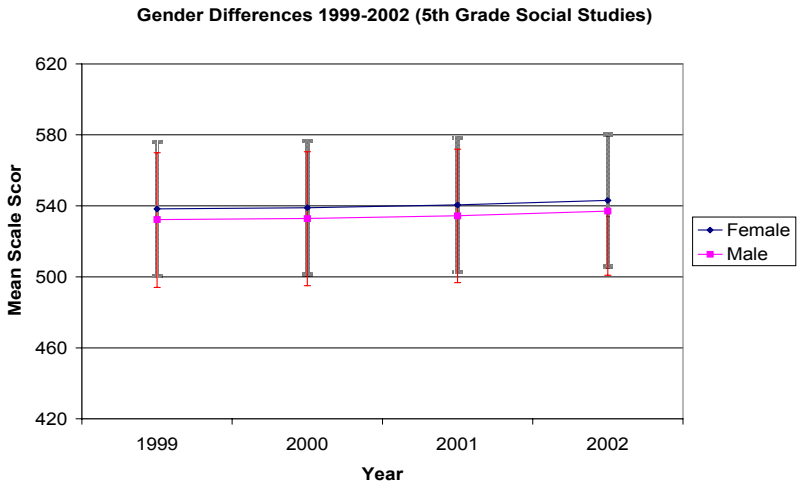
2002
Year
Female
Male


Gender Differences 1999-2002 (5th Grade Social Studies)
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580
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500
460
420
Mean Scale Scor
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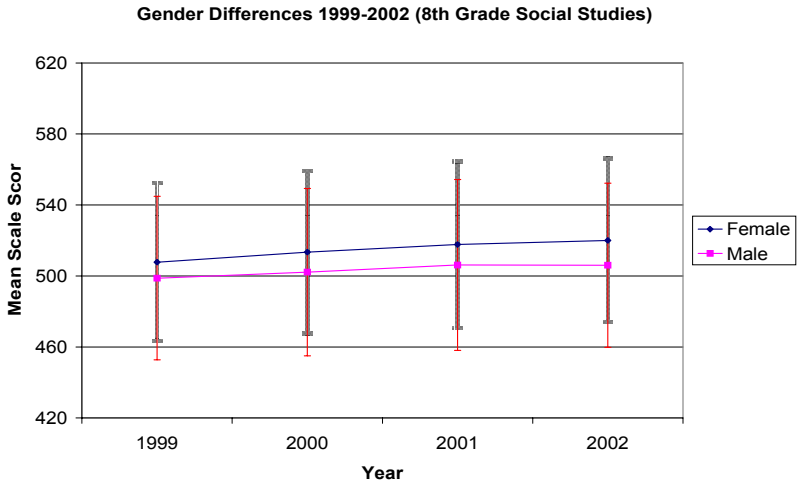
2001
2002
Year
Female
Male


Gender Differences 1999-2002 (8th Grade Social Studies)
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580
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Mean Scale Scor
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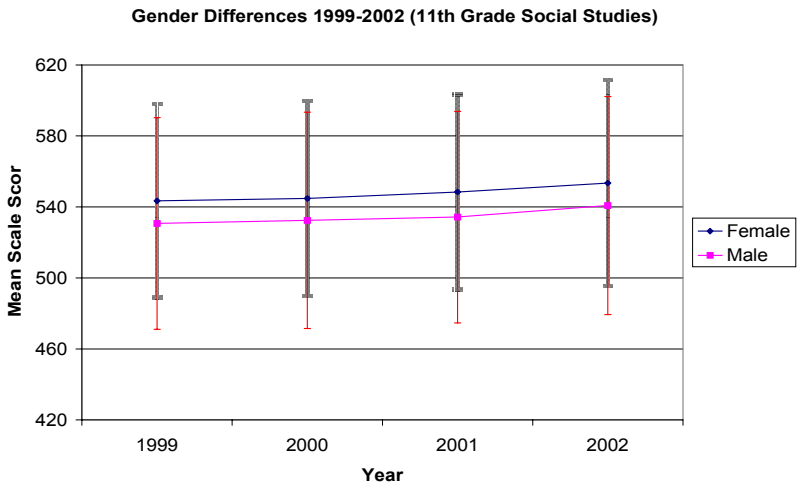
Female
Male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460
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Mean Scale Scor
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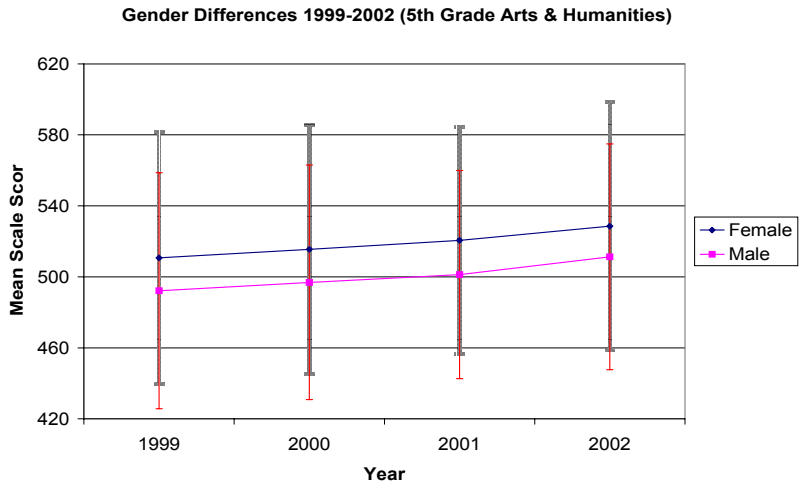
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580
540
500
460
420
Mean Scale Scor
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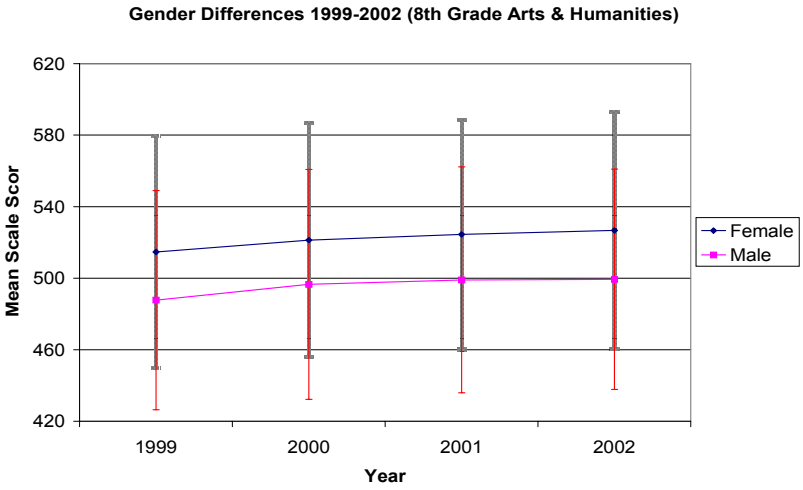
2002
Year
Female
Male


Gender Differences 1999-2002 (8th Grade Arts & Humanities)
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420
Mean Scale Scor
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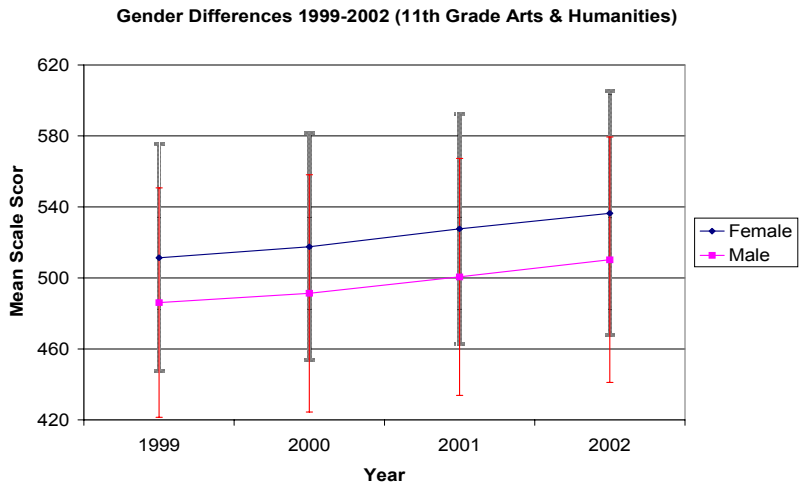
Year
Female
Male


Gender Differences 1999-2002 (11th Grade Arts & Humanities)
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Mean Scale Scor
1999
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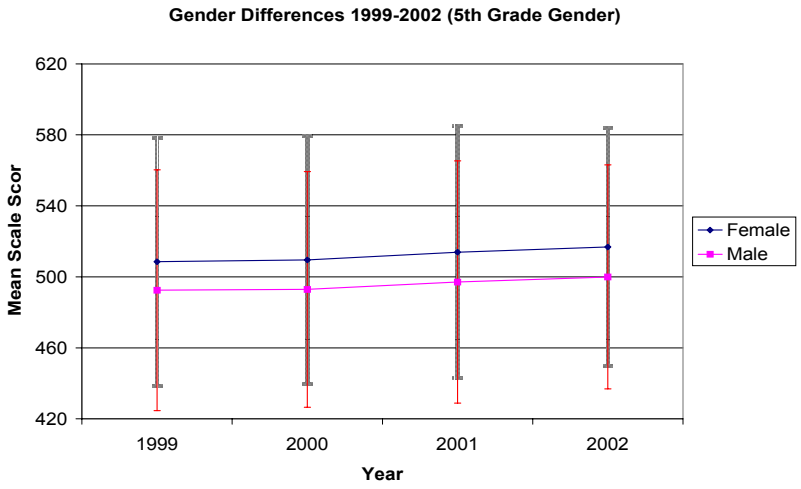
Year
Female
Male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460
420
Mean Scale Scor
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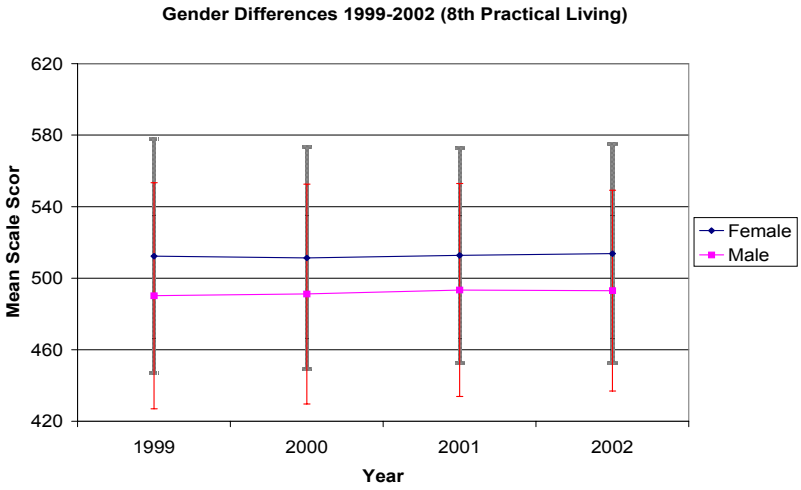
Year
Female
Male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420
Mean Scale Scor
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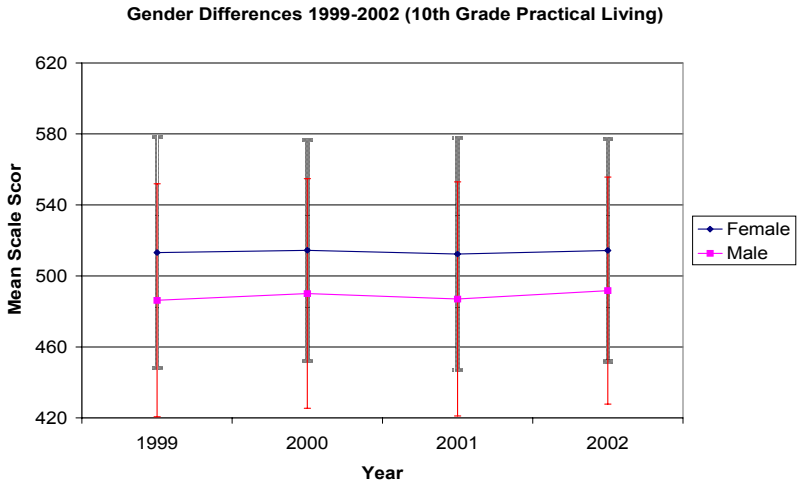
2002
Year
Female
Male


Gender Differences 1999-2002 (10th Grade Practical Living)
620
580
540
500
460
420
Mean Scale Scor
1999
2000
2001
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Year
Female
Male

LEP Differences

Previous research indicates that students with limited proficiency in English score lower on measures of academic achievement than their English-speaking counterparts (Gronna, Chin-Chance & Abedi, 2000). With the possible exception of 4th and 5th grade students, LEP and non-LEP students experienced similar changes in mean KCCT scale scores between 1999 and 2002. The gaps between LEP and non-LEP students, when compared to those between the other student subgroups, experienced the greatest change, ranging from -12.66 (5th grade practical living) and +12.30 (11th grade social studies). This is not surprising, however, considering that the LEP student population is the smallest subgroup examined (less than 0.5% for all but 2001 fourth graders) and thus more likely to experience larger fluctuations in mean scale scores.

Table 22 presents the number of non-LEP and LEP students for each testing year. The proportion of students in each subgroup remained stable between 1999 and 2002, with less than 1% of students being classified as LEP. Tables 23 through 28 present the means and standard deviations depicted by the graphs that follow.

Table 22. Proportion of Non-LEP and LEP Students for Each Grade Level: 1999-2002

Grade		1999	2000	2001	2002
4th	Non-LEP	48,013 (99.6%)	49,009 (99.7%)	50,009 (99.3%)	48,662 (99.6%)
	LEP	203 (0.4%)	157 (0.3%)	349 (0.7%)	213 (0.4%)
5th	Non-LEP	46,337 (99.7%)	47,998 (99.7%)	48,941 (99.7%)	49,601 (99.6%)
	LEP	136 (0.3%)	129 (0.3%)	160 (0.3%)	188 (0.4%)
7th	Non-LEP	47,684 (99.8%)	47,700 (99.8%)	47,108 (99.8%)	48,732 (99.8%)
	LEP	91 (0.2%)	114 (0.2%)	111 (0.2%)	119 (0.2%)
8th	Non-LEP	48,460 (99.8%)	46,994 (99.8%)	47,040 (99.8%)	46,838 (99.7%)
	LEP	74 (0.2%)	94 (0.2%)	91 (0.2%)	118 (0.3%)
10th	Non-LEP	45,476 (99.6%)	44,040 (99.6%)	45,652 (99.5%)	44,702 (99.6%)
	LEP	180 (0.4%)	188 (0.4%)	246 (0.5%)	178 (0.4%)
11th	Non-LEP	40,309 (99.6%)	40,146 (99.6%)	38,837 (99.6%)	40,031 (99.7%)
	LEP	145 (0.4%)	161 (0.4%)	174 (0.4%)	129 (0.3%)

Table 23. Reading Means and Standard Deviations of LEP and Non-LEP Students 1999-2002

	1999			2000			2001			2002	
	LEP	No LEP		LEP	No LEP		LEP	No LEP		LEP	No LEP
4th Grade											
Mean	523.23	544.52	Mean	527.10	545.60	Mean	427.76	544.06	Mean	530.89	548.19
S.D.	55.58	38.45	S.D.	37.87	36.06	S.D.	106.27	42.70	S.D.	36.88	34.85
7th Grade											
Mean	489.37	509.96	Mean	481.51	509.75	Mean	487.95	511.91	Mean	483.38	513.04
S.D.	33.41	36.92	S.D.	40.28	35.60	S.D.	45.91	34.07	S.D.	47.63	33.94
10th Grade											
Mean	461.52	495.88	Mean	459.46	502.81	Mean	416.41	502.58	Mean	475.42	502.93
S.D.	58.05	57.81	S.D.	56.55	57.70	S.D.	75.36	61.60	S.D.	48.79	58.32

Table 24. Science Means and Standard Deviations of LEP and Non-LEP Students 1999-2002

	1999			2000			2001			2002	
	LEP	No LEP		LEP	No LEP		LEP	No LEP		LEP	No LEP
4th Grade											
Mean	517.93	538.08	Mean	526.24	541.22	Mean	425.89	542.53	Mean	526.46	545.98
S.D.	52.11	35.20	S.D.	35.56	32.97	S.D.	104.87	40.70	S.D.	39.77	31.55
7th Grade											
Mean	475.11	496.87	Mean	473.11	497.87	Mean	473.64	499.52	Mean	469.93	502.10
S.D.	35.73	34.11	S.D.	35.51	34.36	S.D.	41.27	33.65	S.D.	49.07	34.02
11th Grade											
Mean	507.34	534.92	Mean	503.55	536.51	Mean	509.02	539.27	Mean	504.77	541.94
S.D.	57.92	45.56	S.D.	55.81	45.88	S.D.	53.46	42.63	S.D.	55.02	42.66

Table 25. Math Means and Standard Deviations of LEP and Non-LEP Students 1999-2002

	1999			2000			2001			2002	
	LEP	No LEP		LEP	No LEP		LEP	No LEP		LEP	No LEP
5th Grade											
Mean	539.53	550.47	Mean	517.99	553.18	Mean	526.48	558.18	Mean	549.02	560.52
S.D.	54.46	44.60	S.D.	68.87	45.01	S.D.	80.38	43.98	S.D.	45.81	43.57
8th Grade											
Mean	502.26	523.35	Mean	502.44	527.18	Mean	509.71	530.48	Mean	501.92	529.91
S.D.	60.47	45.00	S.D.	55.07	43.29	S.D.	53.09	41.71	S.D.	58.71	41.17
11th Grade											
Mean	495.26	522.13	Mean	494.03	523.73	Mean	505.54	529.33	Mean	507.95	531.47
S.D.	71.43	56.45	S.D.	69.21	56.13	S.D.	54.22	52.59	S.D.	62.20	53.01

Table 26. Social Studies Means and Standard Deviations of LEP and Non-LEP Students 1999-2002

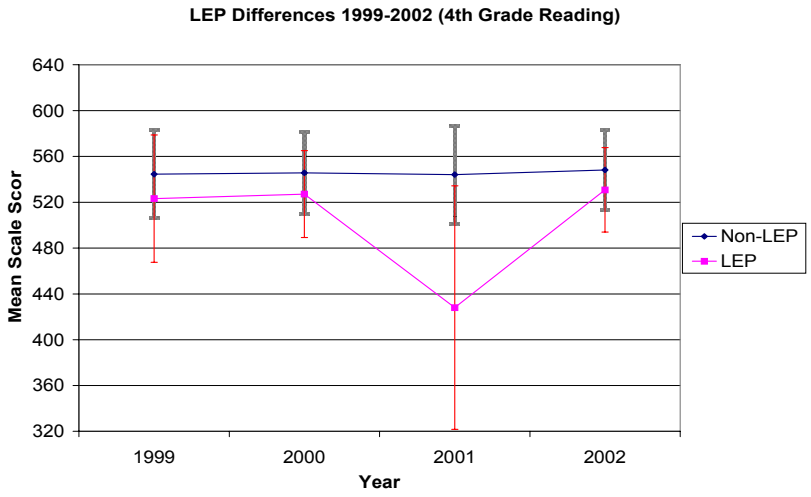
	1999			2000			2001			2002	
	LEP	No LEP		LEP	No LEP		LEP	No LEP		LEP	No LEP
5th Grade											
Mean	510.74	535.26	Mean	496.22	535.90	Mean	504.29	537.46	Mean	521.91	540.05
S.D.	50.80	38.02	S.D.	62.61	37.72	S.D.	68.44	37.54	S.D.	39.40	36.76
8th Grade											
Mean	470.43	503.16	Mean	473.26	507.69	Mean	483.13	511.87	Mean	477.21	512.95
S.D.	57.48	45.44	S.D.	64.33	46.74	S.D.	60.02	47.84	S.D.	48.73	46.69
11th Grade											
Mean	506.77	537.28	Mean	500.93	538.80	Mean	505.00	541.64	Mean	504.42	547.23
S.D.	61.26	57.36	S.D.	57.74	58.37	S.D.	58.90	57.66	S.D.	63.11	60.07

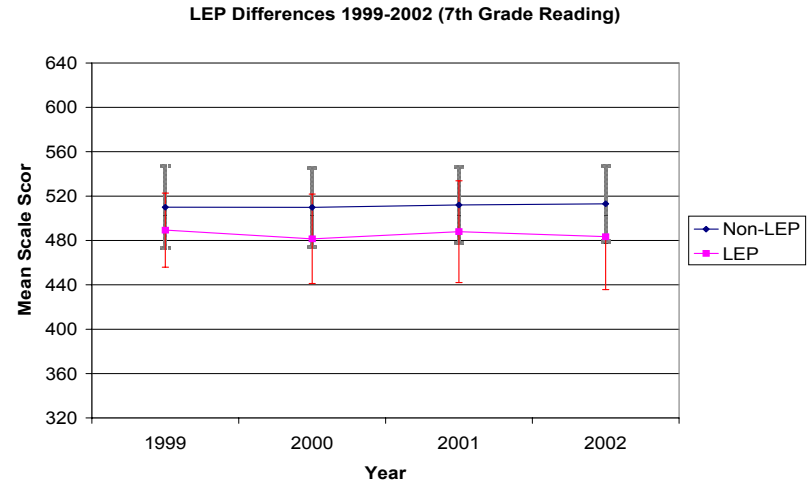
Table 27. Arts & Humanities Means and Standard Deviations of LEP and Non-LEP Students 1999-2002

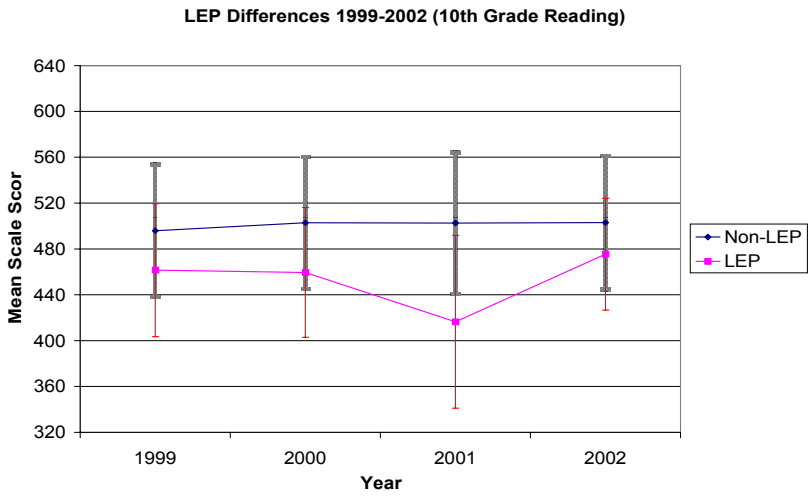
	1999			2000			2001			2002	
	LEP	No LEP		LEP	No LEP		LEP	No LEP		LEP	No LEP
5th Grade											
Mean	470.58	501.26	Mean	454.72	506.02	Mean	470.93	510.79	Mean	491.11	519.87
S.D.	80.37	69.34	S.D.	70.21	68.63	S.D.	76.25	61.92	S.D.	65.30	67.25
8th Grade											
Mean	463.49	500.74	Mean	470.24	508.59	Mean	465.96	511.56	Mean	467.14	512.83
S.D.	60.65	64.43	S.D.	66.65	65.96	S.D.	62.92	64.91	S.D.	58.41	65.40
11th Grade											
Mean	460.32	499.07	Mean	468.77	504.67	Mean	483.64	514.47	Mean	478.64	523.44
S.D.	74.61	65.45	S.D.	60.92	66.73	S.D.	68.44	67.12	S.D.	69.75	70.08

Table 28. Practical Living Means and Standard Deviations of LEP and Non-LEP Students 1999-2002

	1999			2000			2001			2002	
	LEP	No LEP		LEP	No LEP		LEP	No LEP		LEP	No LEP
5th Grade											
Mean	460.28	500.40	Mean	449.06	501.09	Mean	465.23	505.42	Mean	480.86	508.32
S.D.	68.66	69.24	S.D.	68.68	68.50	S.D.	81.97	70.08	S.D.	68.68	65.45
8th Grade											
Mean	455.22	500.91	Mean	458.70	501.00	Mean	460.65	502.92	Mean	468.09	503.24
S.D.	59.39	65.24	S.D.	62.36	62.57	S.D.	54.97	60.55	S.D.	59.87	59.47
10th Grade											
Mean	459.53	499.60	Mean	457.26	502.31	Mean	411.59	499.75	Mean	461.09	502.93
S.D.	70.21	66.74	S.D.	70.36	64.54	S.D.	75.75	66.46	S.D.	59.89	64.26


LEP Differences 1999-2002 (4th Grade Reading)
640
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (7th Grade Reading)
640
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (10th Grade Reading)
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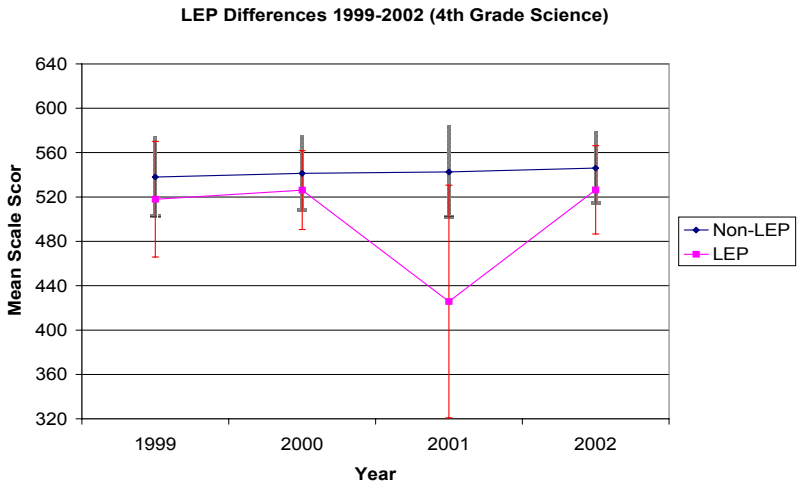
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (4th Grade Science)
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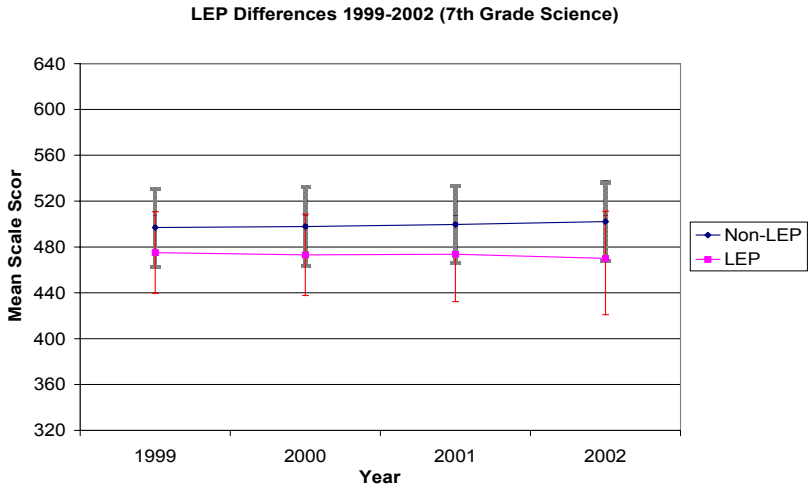
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (7th Grade Science)
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600
560
520
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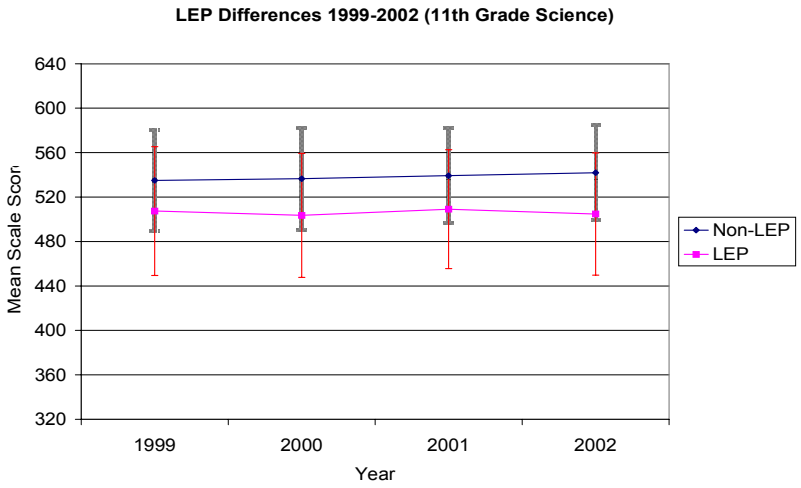
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (11th Grade Science)
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600
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520
480
440
400
360
320
Mean Scale Scor
1999
2000
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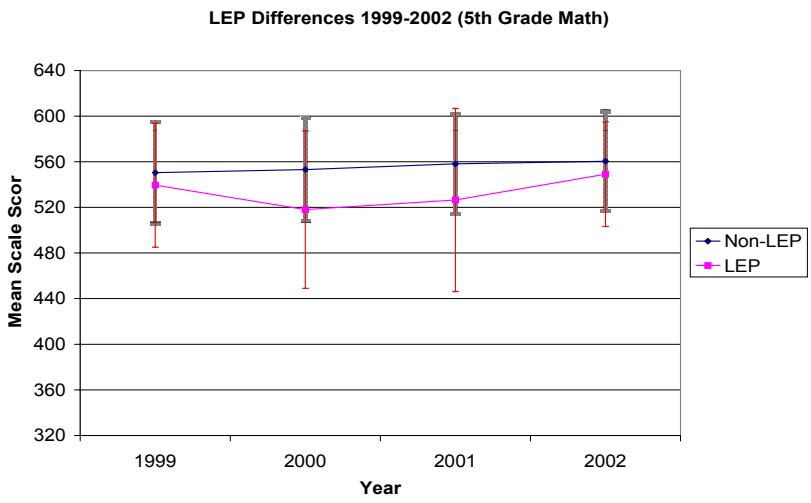
Year
Non-LEP
LEP


LEP Differences 1999-2002 (5th Grade Math)
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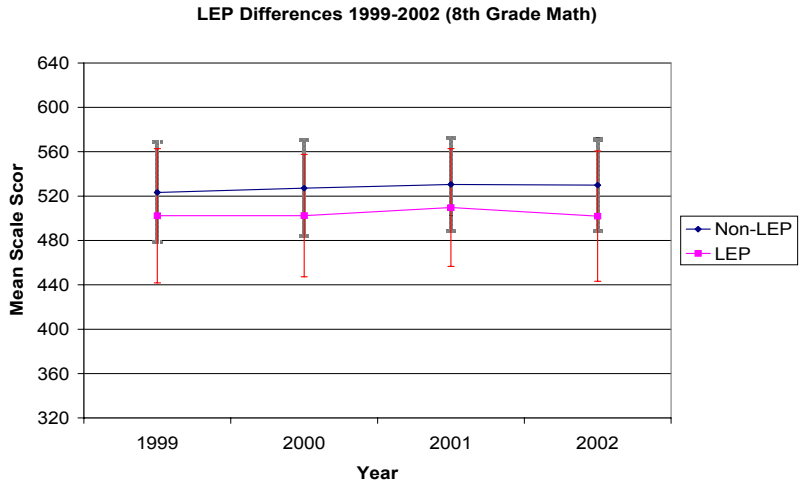
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (8th Grade Math)
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600
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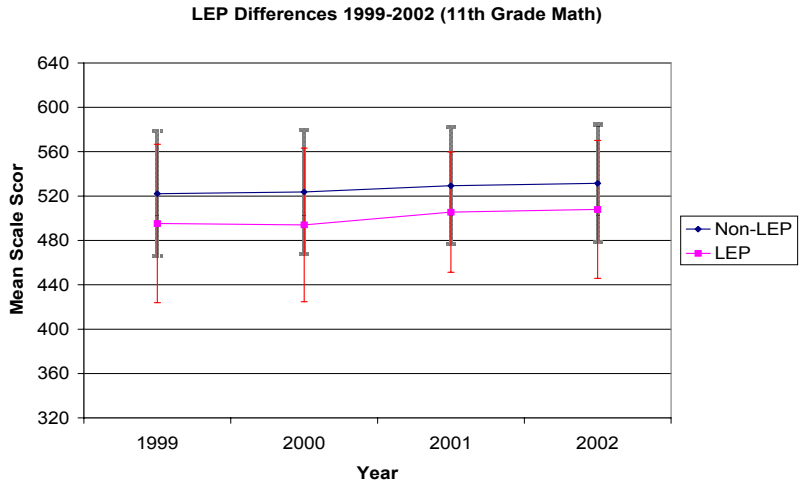
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (11th Grade Math)
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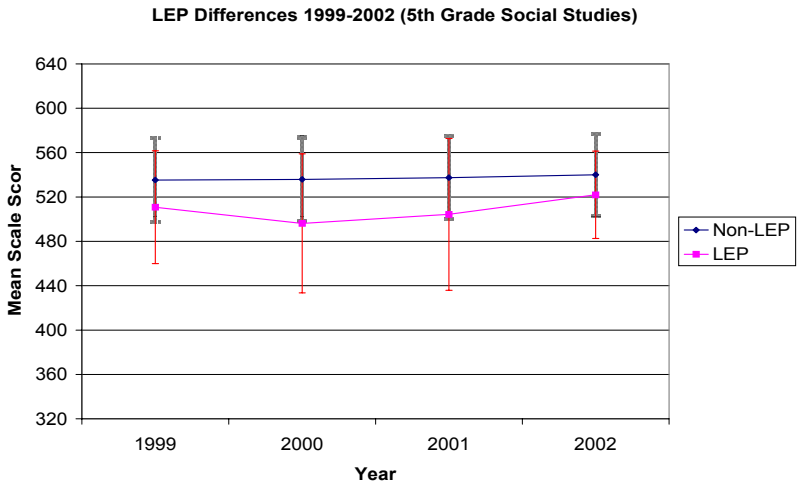
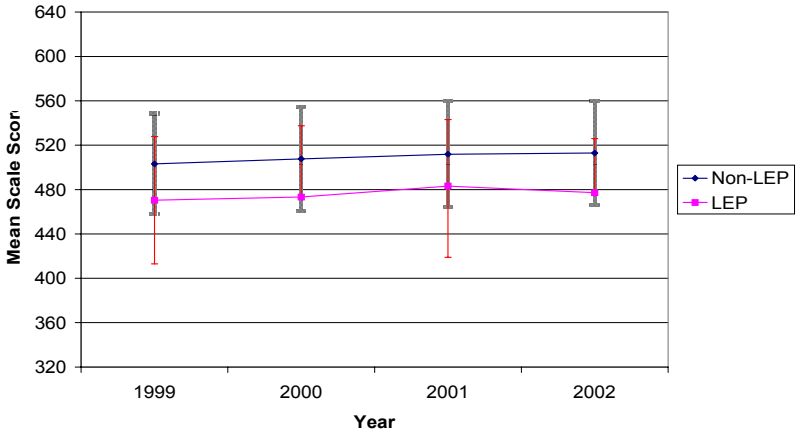
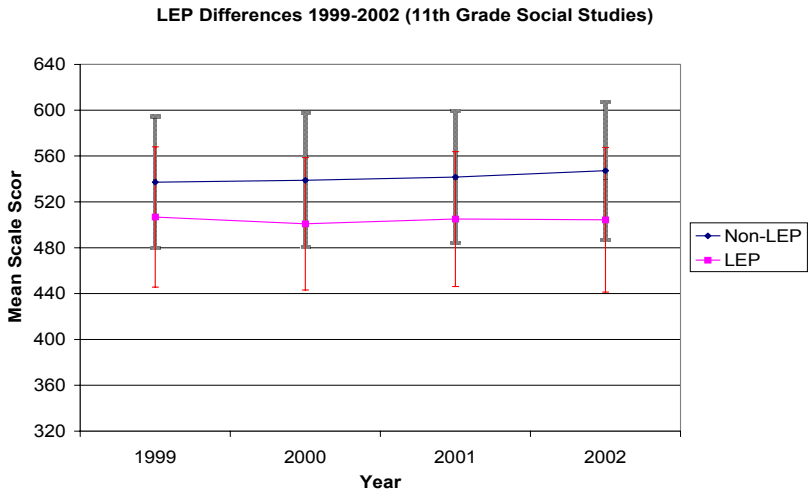
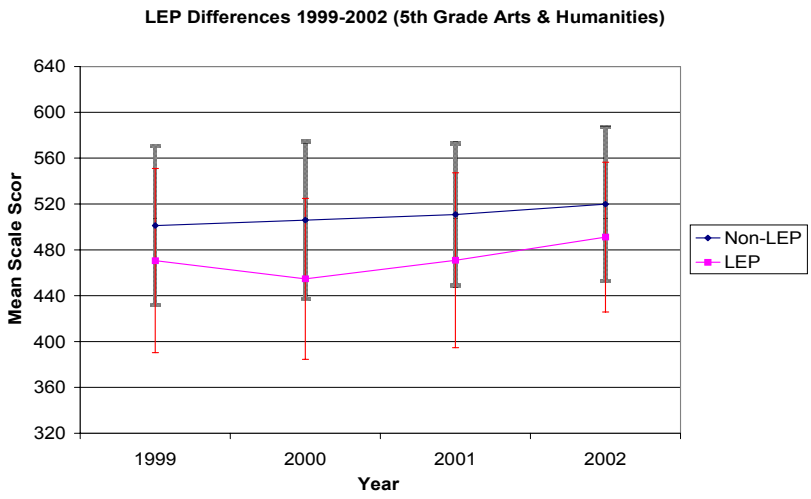
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (5th Grade Social Studies)
640
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (8th Grade Social Studies)
640
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (11th Grade Social Studies)
640
600
560
520
480
440
400
360
320
Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (5th Grade Arts & Humanities)
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Mean Scale Scor
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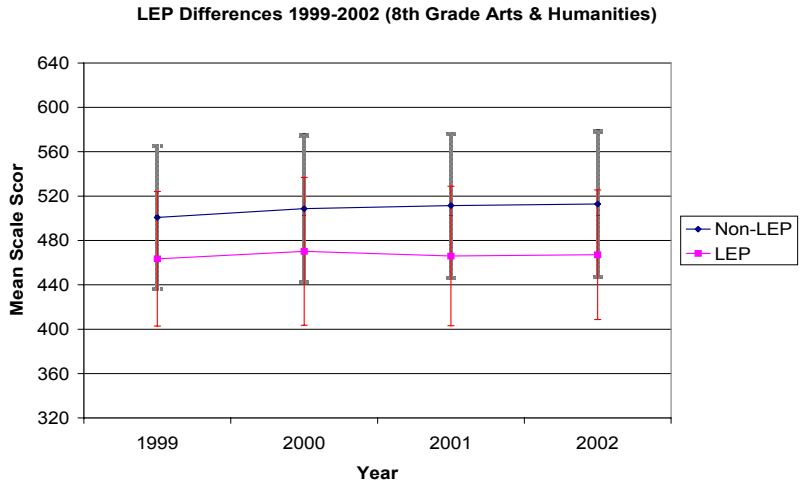
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (8th Grade Arts & Humanities)
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Mean Scale Scor
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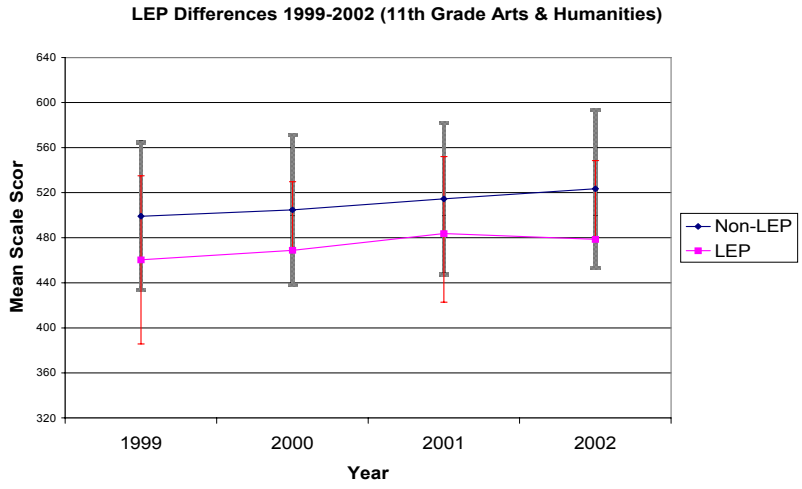
Year
Non-LEP
LEP


LEP Differences 1999-2002 (11th Grade Arts & Humanities)
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Mean Scale Scor
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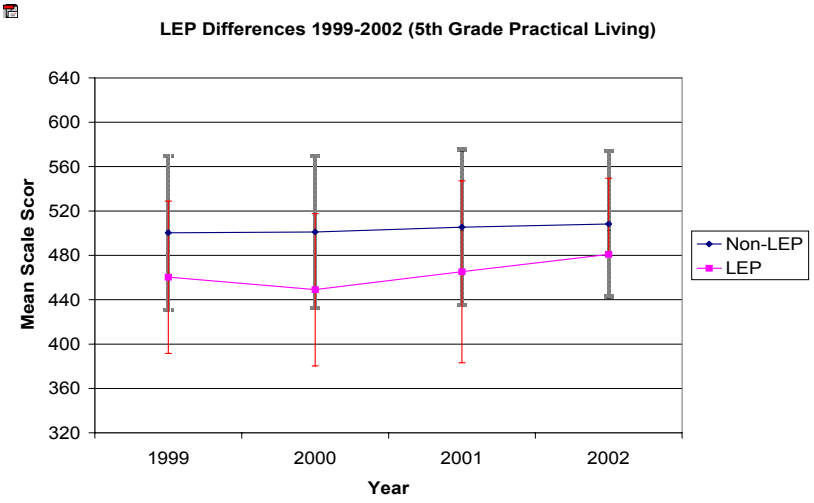
Year
Non-LEP
LEP


LEP Differences 1999-2002 (5th Grade Practical Living)
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Mean Scale Scor
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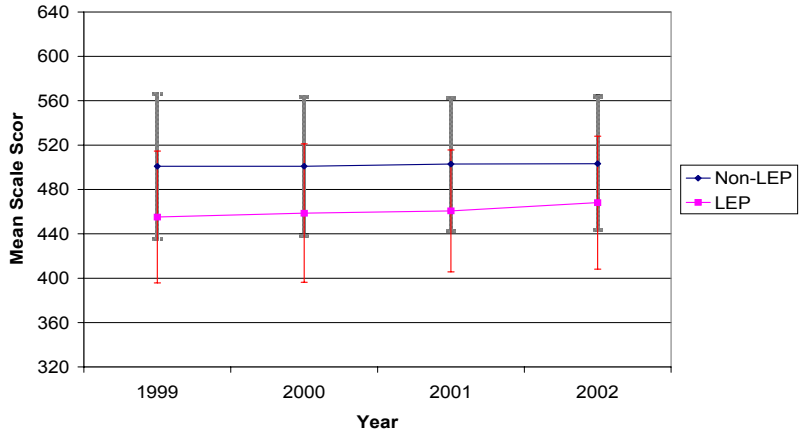
Year
Non-LEP
LEP


LEP Differences 1999-2002 (8th Grade Practical Living)
640
600
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Mean Scale Scor
1999
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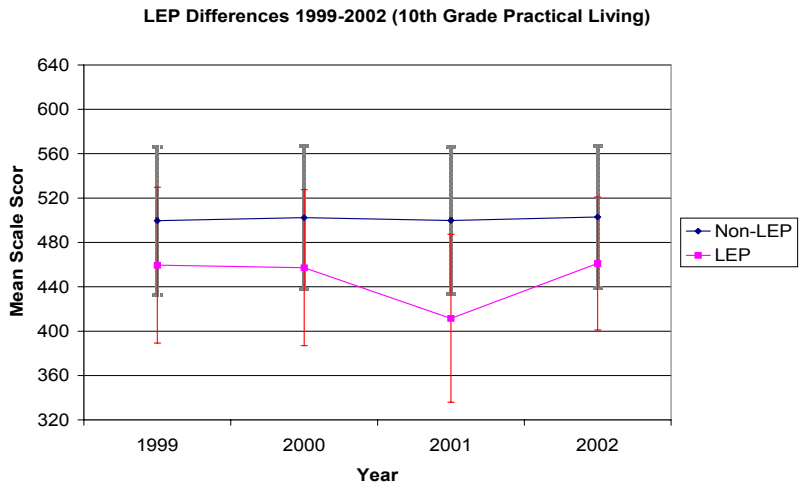
2002
Year
Non-LEP
LEP


LEP Differences 1999-2002 (10th Grade Practical Living)
640
600
560
520
480
440
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Mean Scale Scor
1999
2000
2001
2002
Year
Non-LEP
LEP

SES Differences

Previous research has found that students from lower socioeconomic backgrounds tend to score lower on measures of achievement that those students from higher socioeconomic backgrounds (Camara & Schmidt, 1999). The current research reflects this pattern. Here, students' lunch status was used as an indicator of SES. Students who receive free/reduced price lunch are compared to those who do not. The two groups experienced similar changes over time, with gaps remaining fairly stable. Two exceptions include 11th grade social studies and arts & humanities, where the gap between low- and high-income students increased (6.93 and 7.80 scale score points, respectively). Bars are included in each graph and represent one standard deviation above and below the mean scale score for each testing year. In all cases the error bars for low-income students encompass the mean for high-income students, indicating that many low-income students outscore their high-income peers.

Table 29 presents numbers of students eligible and not eligible for free/reduced lunch. Though numbers remained stable within each grade level over the four-year period, it is interesting to note that the proportion of students receiving free/reduced lunch decreases from one grade level to the next. This suggests that older students are less likely to apply for this type of assistance. The reduction in population of students receiving free/reduced lunch as grade level increases does not seem to result in a similar decrease in the gap between the two groups, however. Tables 30 through 35 present the means and standard deviations depicted by the graphs that follow.

Table 29. Proportion of Students Eligible and Not Eligible for Free/Reduced Lunch: 1999-2002

Grade		1999	2000	2001	2002
4th	Not Eligible	25,235 (52%)	25,172 (51%)	25,579 (51%)	24,102 (49%)
	Eligible	22,981 (48%)	23,994 (49%)	24,779 (49%)	24,773 (51%)
5th	Not Eligible	25,145 (54%)	25,110 (52%)	25,974 (53%)	25,154 (51%)
	Eligible	21,328 (46%)	23,017 (48%)	23,127 (47%)	24,635 (49%)
7th	Not Eligible	28,195 (59%)	27,106 (57%)	27,094 (57%)	26,659 (55%)
	Eligible	19,580 (41%)	20,708 (43%)	20,125 (43%)	22,192 (45%)
8th	Not Eligible	29,832 (61%)	28,120 (60%)	27,925 (59%)	26,940 (57%)
	Eligible	18,702 (39%)	18,968 (40%)	19,206 (41%)	20,016 (43%)
10th	Not Eligible	32,813 (72%)	30,635 (69%)	31,806 (69%)	29,698 (66%)
	Eligible	12,843 (28%)	13,593 (31%)	14,092 (31%)	15,182 (34%)
11th	Not Eligible	30,790 (76%)	29,991 (74%)	28,537 (73%)	28,490 (71%)
	Eligible	9,664 (24%)	10,316 (26%)	10,474 (27%)	11,670 (29%)

Table 30. Reading Means and Standard Deviations of Free/Reduced Lunch and Non-Free Reduced/Lunch Students 1999-2002

	1999			2000			2001			2002	
	F/R	No F/R		F/R	No F/R		F/R	No F/R		F/R	No F/R
4th Grade											
Mean	537.03	555.07	Mean	538.24	556.00	Mean	536.89	553.44	Mean	541.25	558.55
S.D.	36.29	36.04	S.D.	34.02	33.85	S.D.	40.36	43.81	S.D.	32.74	33.39
7th Grade											
Mean	500.58	518.82	Mean	500.80	519.27	Mean	503.34	520.71	Mean	504.95	522.47
S.D.	34.30	35.55	S.D.	31.95	34.19	S.D.	31.19	32.73	S.D.	31.00	32.74
10th Grade											
Mean	480.48	508.16	Mean	484.32	511.68	Mean	480.76	509.32	Mean	484.68	514.49
S.D.	63.44	66.16	S.D.	59.75	64.21	S.D.	61.45	66.37	S.D.	59.72	62.99

Table 31. Science Means and Standard Deviations of Free/Reduced Lunch and Non-Free Reduced/Lunch Students 1999-2002

	1999			2000			2001			2002	
	F/R	No F/R		F/R	No F/R		F/R	No F/R		F/R	No F/R
4th Grade											
Mean	531.56	547.42	Mean	534.73	550.55	Mean	536.45	550.70	Mean	540.49	554.66
S.D.	34.17	32.05	S.D.	31.73	29.62	S.D.	39.09	41.25	S.D.	30.21	29.31
7th Grade											
Mean	488.34	505.07	Mean	489.62	507.12	Mean	491.90	507.84	Mean	494.54	511.49
S.D.	32.68	31.23	S.D.	31.80	31.28	S.D.	31.60	31.11	S.D.	32.51	31.03
11th Grade											
Mean	521.55	539.94	Mean	523.58	541.87	Mean	526.24	545.08	Mean	527.76	548.93
S.D.	46.92	43.60	S.D.	45.83	43.94	S.D.	42.19	40.55	S.D.	42.94	39.67

Table 32. Math Means and Standard Deviations of Free/Reduced Lunch and Non-Free/Reduced Lunch Students 1999-2002

	1999			2000			2001			2002	
	F/R	No F/R		F/R	No F/R		F/R	No F/R		F/R	No F/R
5th Grade											
Mean	540.41	563.26	Mean	543.12	566.64	Mean	549.03	570.67	Mean	551.10	573.94
S.D.	42.04	41.44	S.D.	43.00	40.67	S.D.	40.48	41.66	S.D.	40.50	40.80
8th Grade											
Mean	511.20	534.17	Mean	515.03	538.28	Mean	518.84	541.40	Mean	518.99	541.25
S.D.	43.14	40.70	S.D.	41.32	39.18	S.D.	40.48	37.29	S.D.	36.38	36.38
11th Grade											
Mean	504.33	529.02	Mean	504.59	531.48	Mean	510.66	537.52	Mean	512.94	540.68
S.D.	56.87	53.89	S.D.	56.68	53.34	S.D.	52.48	49.49	S.D.	52.87	49.57

Table 33. Social Studies Means and Standard Deviations of Free/Reduced Lunch and Non-Free/Reduced Lunch Students 1999-2002

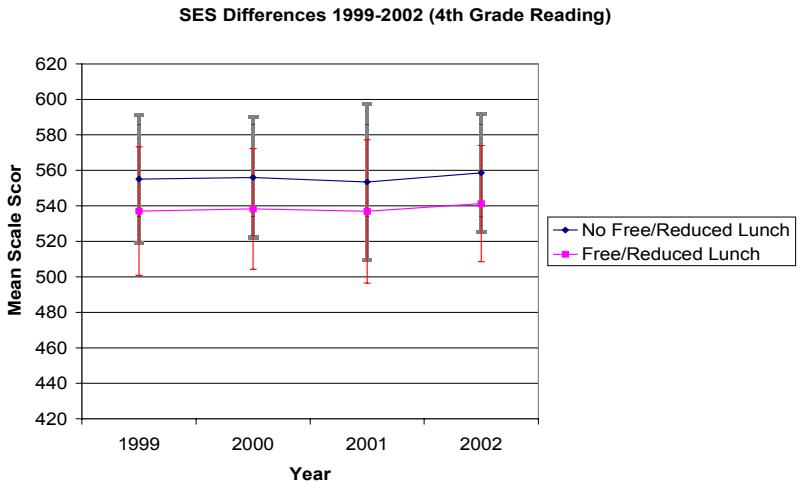
	1999			2000			2001			2002	
	F/R	No F/R		F/R	No F/R		F/R	No F/R		F/R	No F/R
5th Grade											
Mean	526.83	545.69	Mean	527.34	547.25	Mean	529.45	548.04	Mean	532.12	551.35
S.D.	35.58	35.99	S.D.	35.03	35.30	S.D.	38.71	35.70	S.D.	34.33	34.80
8th Grade											
Mean	489.94	514.64	Mean	494.51	519.70	Mean	497.36	525.04	Mean	499.84	526.07
S.D.	42.46	42.26	S.D.	41.94	44.82	S.D.	43.21	45.57	S.D.	42.14	44.98
11th Grade											
Mean	518.56	544.20	Mean	519.19	546.57	Mean	521.84	550.21	Mean	525.51	557.61
S.D.	56.40	55.59	S.D.	55.79	56.68	S.D.	52.90	56.32	S.D.	55.97	58.10

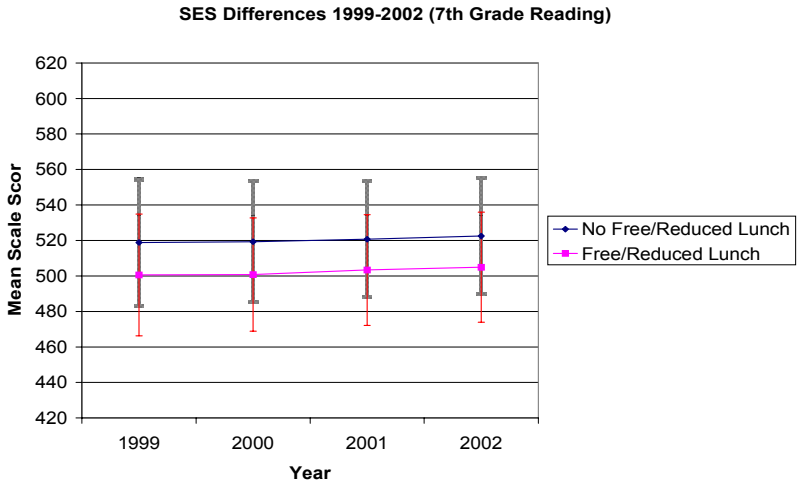
Table 34. Arts & Humanities Means and Standard Deviations of Free/Reduced Lunch and Non-Free/Reduced Lunch Students 1999-2002

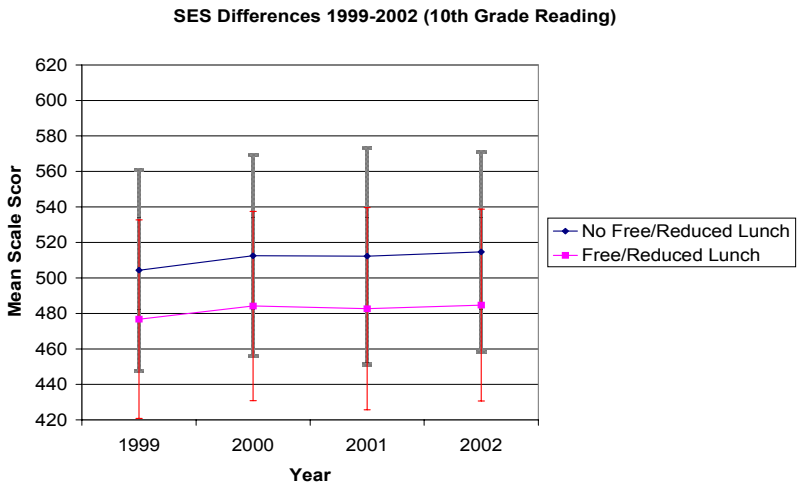
	1999			2000			2001			2002	
	F/R	No F/R		F/R	No F/R		F/R	No F/R		F/R	No F/R
5th Grade											
Mean	486.99	518.50	Mean	491.98	524.70	Mean	499.54	526.03	Mean	506.77	537.96
S.D.	62.79	69.31	S.D.	63.36	67.12	S.D.	56.20	62.33	S.D.	58.63	69.47
8th Grade											
Mean	484.38	514.83	Mean	492.17	523.45	Mean	494.21	527.43	Mean	496.33	529.18
S.D.	57.63	64.04	S.D.	59.74	65.11	S.D.	57.72	64.15	S.D.	57.23	65.74
11th Grade											
Mean	480.20	505.93	Mean	485.79	512.21	Mean	494.07	523.32	Mean	501.84	533.91
S.D.	59.06	65.82	S.D.	61.41	66.50	S.D.	61.48	66.73	S.D.	63.21	69.62

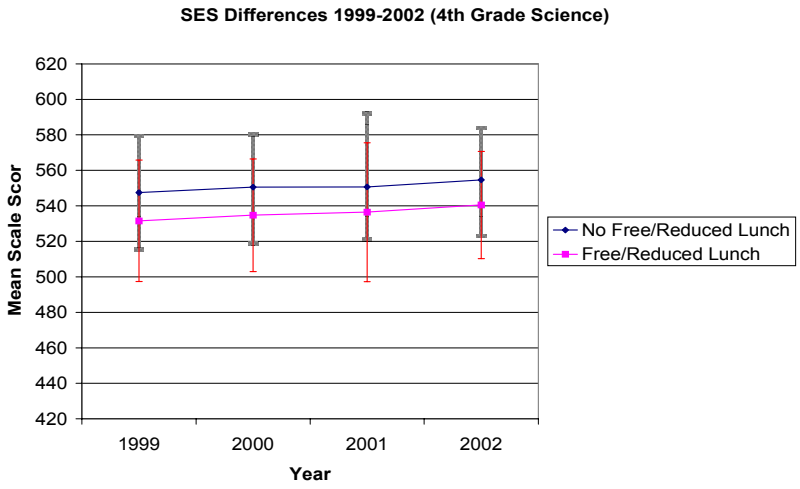
Table 35. Practical Living Means and Standard Deviations of Free/Reduced Lunch and Non-Free/Reduced Lunch Students 1999-2002

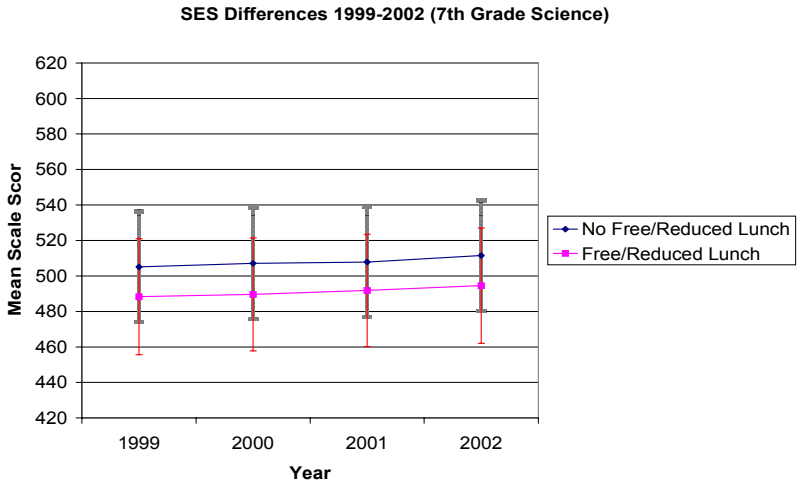
	1999			2000			2001			2002	
	F/R	No F/R		F/R	No F/R		F/R	No F/R		F/R	No F/R
5th Grade											
Mean	486.89	517.25	Mean	487.62	518.22	Mean	492.80	522.21	Mean	496.32	524.87
S.D.	64.77	67.50	S.D.	63.91	67.23	S.D.	66.33	69.88	S.D.	59.61	66.14
8th Grade											
Mean	484.40	514.91	Mean	486.06	514.43	Mean	486.89	517.29	Mean	488.60	517.44
S.D.	59.24	64.02	S.D.	57.13	61.73	S.D.	54.25	59.78	S.D.	51.52	60.72
10th Grade											
Mean	480.48	508.16	Mean	484.32	511.68	Mean	480.76	509.32	Mean	484.68	514.49
S.D.	63.44	66.16	S.D.	59.75	64.21	S.D.	61.45	66.37	S.D.	59.72	62.99

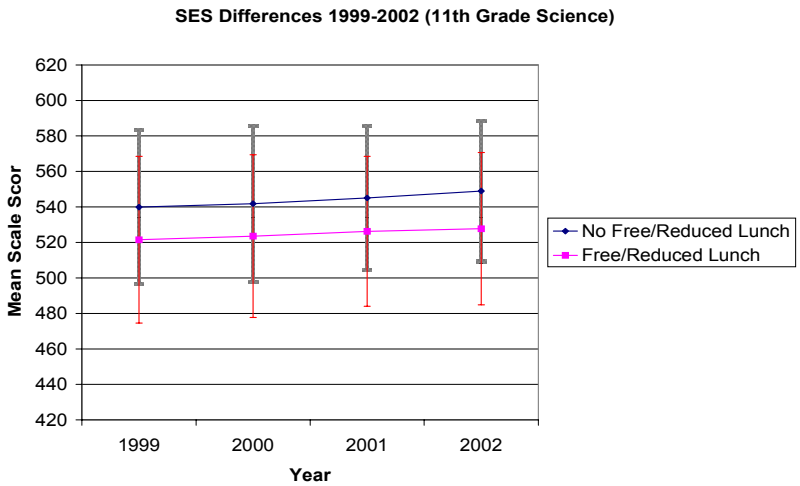

SES Differences 1999-2002 (4th Grade Reading)
620
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (7th Grade Reading)
620
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (10th Grade Reading)
620
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (4th Grade Science)
620
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (7th Grade Science)
620
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch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600
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560
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500
480
460
440
420
Mean Scale Scor
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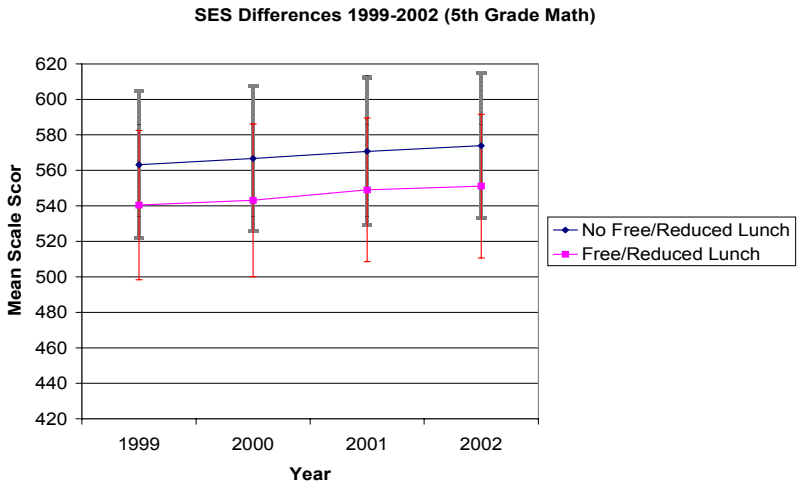
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch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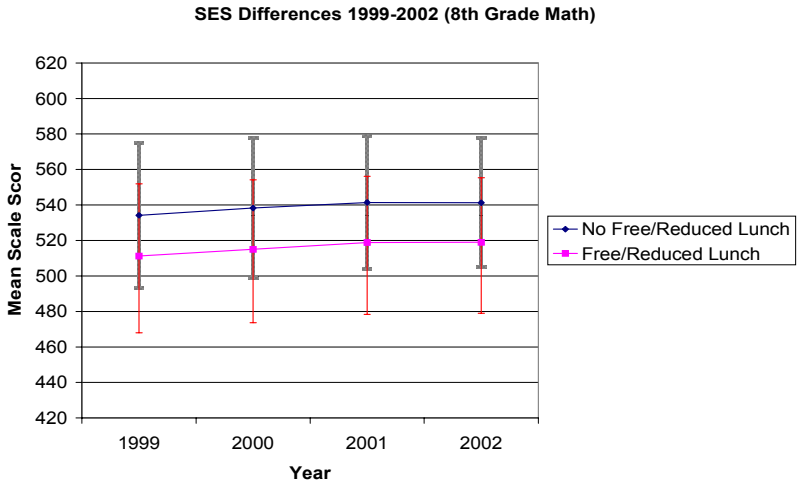
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (8th Grade Math)
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600
580
560
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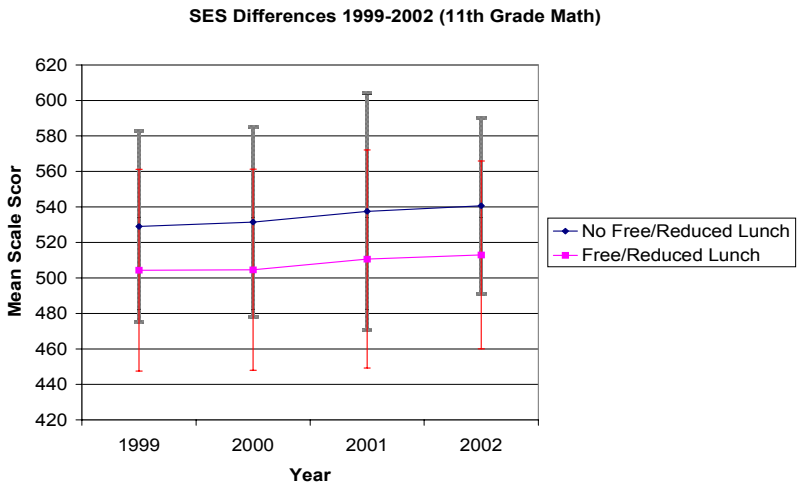
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (11th Grade Math)
620
600
580
560
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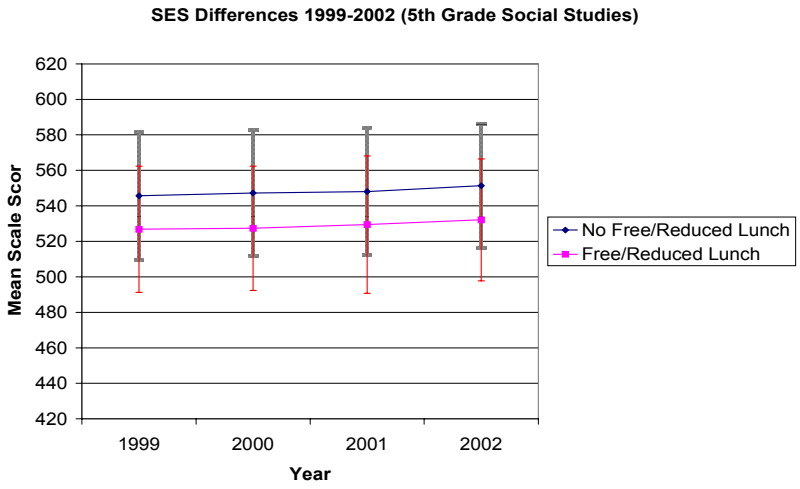
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (5th Grade Social Studies)
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600
580
560
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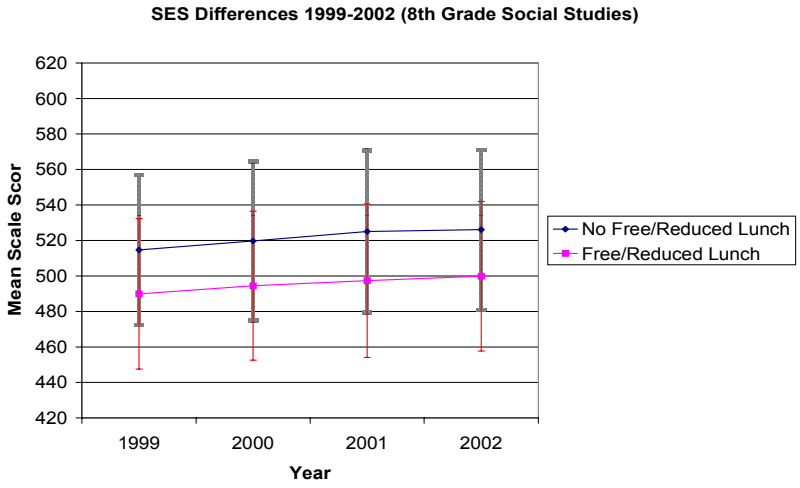
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch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600
580
560
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520
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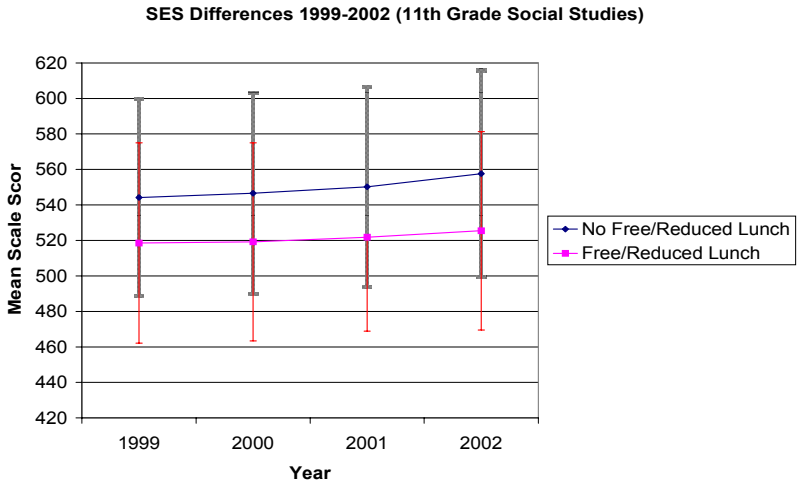
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (11th Grade Social Studies)
620
600
580
560
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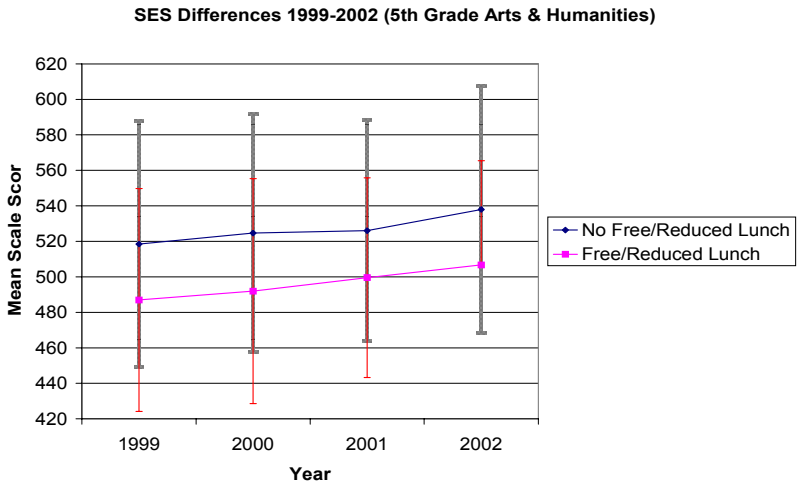
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (5th Grade Arts & Humanities)
620
600
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560
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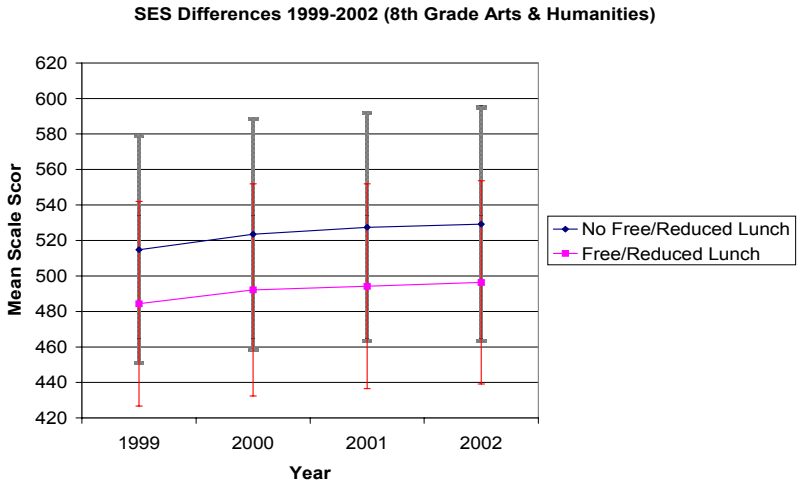
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (8th Grade Arts & Humanities)
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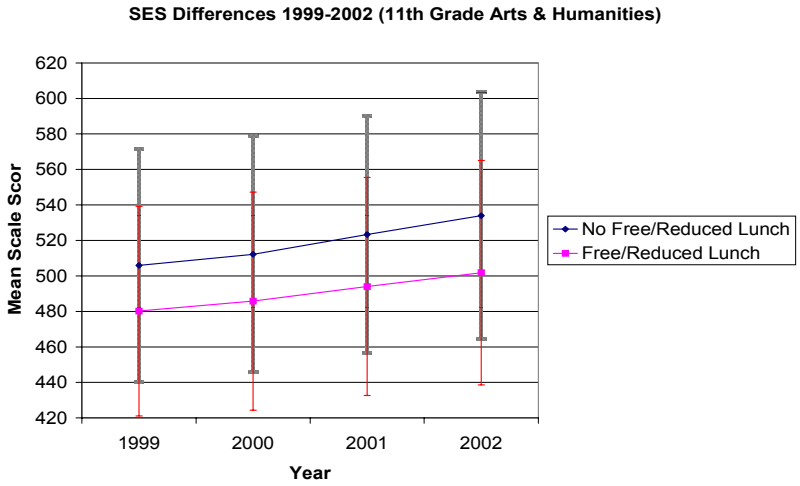
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (11th Grade Arts & Humanities)
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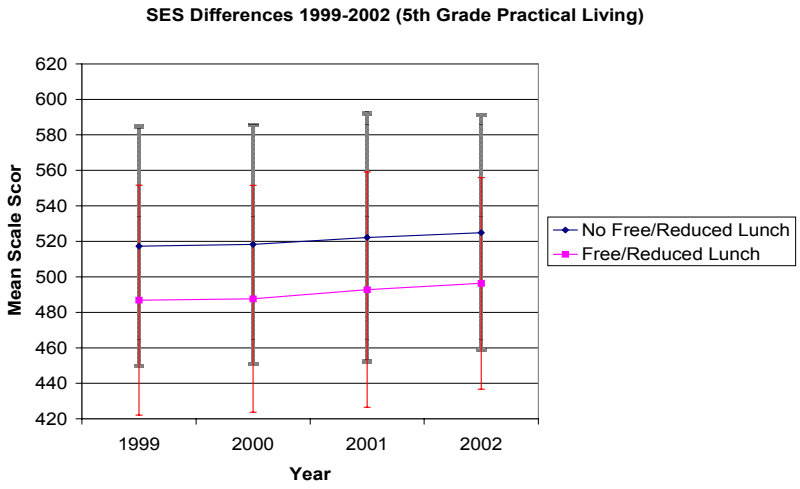
600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (5th Grade Practical Living)
620
600
580
560
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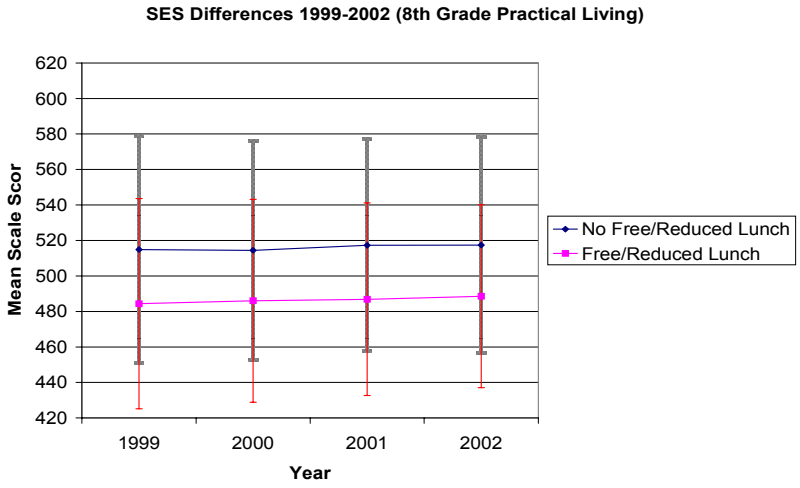
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (8th Grade Practical Living)
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600
580
560
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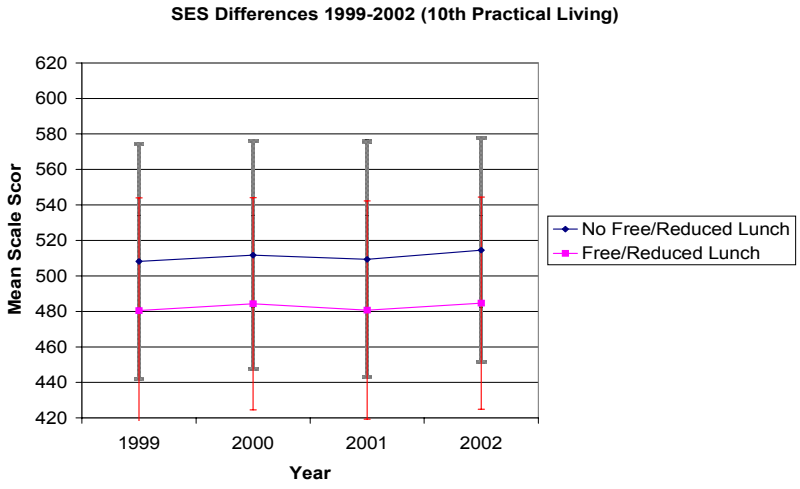
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch


SES Differences 1999-2002 (10th Practical Living)
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600
580
560
540
520
500
480
460
440
420
Mean Scale Scor
1999
2000
2001
2002
Year
No Free/Reduced Lunch
Free/Reduced Lunch

Correlations Among Subgroup Membership and Scale Score

Tables 36 through 41 present correlation coefficients for each student subgroup at each subject area/grade level combination. All subgroups were coded such that a negative correlation reflects the negative impact of membership in hypothesized low-performing subgroups (e.g., males are coded as 1 and females 0; blacks are coded as 1 and whites as 0). Subgroups correlate negatively with student scale scores, thus males score lower than females, African American students score lower than White students, students with disabilities score lower than students without disabilities, and students eligible for free/reduced lunch score lower than students not eligible for free/reduced lunch. The correlation between student disability status and scale score is highest in magnitude at all grade level and subject area combinations, with the exception of 4th grade reading and 5th grade social studies, arts & humanities, and practical living.

The LEP variable was not included in this analysis because of the small size of the LEP population. Only White and African American students were used in the ethnicity analyses for the same reason.

Table 36. Correlations Among 4th Grade Student Subgroups and Scale Scores

	Reading	Science	Gender	Ethnicity	Disability	Lunch
Reading	1.00					
Science	.85	1.00				
Gender	-.13	-.01	1.00			
Ethnicity	-.15	-.18	.00	1.00		
Disability	-.24	-.23	.13	.04	1.00	
Lunch	-.24	-.22	.00	.20	.13	1.00

Table 37. Correlations Among 5th Grade Student Subgroups and Scale Scores

	Math	Social Studies	Arts & Humanities	Practical Living	Gender	Ethnicity	Disability	Lunch
Math	1.00							
Social Studies	.80	1.00						
Arts & Humanities	.65	.70	1.00					
Practical Living	.63	.68	.61	1.00				
Gender	-.05	-.08	-.13	-.13	1.00			
Ethnicity	-.17	-.17	-.16	-.15	-.01	1.00		
Disability	-.29	-.27	-.23	-.23	.13	.03	1.00	
Lunch	-.28	-.27	-.27	-.25	.00	.21	.14	1.00

Table 38. Correlations Among 7th Grade Student Subgroups and Scale Scores

	Reading	Science	Gender	Ethnicity	Disability	Lunch
Reading	1.00					
Science	.82	1.00				
Gender	-.19	-.01	1.00			
Ethnicity	-.16	-.20	.00	1.00		
Disability	-.34	-.32	.14	.05	1.00	
Lunch	-.28	-.28	.00	.16	.14	1.00

Table 39. Correlations Among 8th Grade Student Subgroups and Scale Scores

	Math	Social Studies	Arts & Humanities	Practical Living	Gender	Ethnicity	Disability	Lunch
Math	1.00							
Social Studies	.81	1.00						
Arts & Humanities	.70	.78	1.00					
Practical Living	.68	.76	.71	1.00				
Gender	-.06	-.14	-.20	-.17	1.00			
Ethnicity	-.17	-.16	-.13	-.14	.00	1.00		
Disability	-.40	-.40	-.36	-.34	.14	.05	1.00	
Lunch	-.28	-.30	-.28	-.27	.00	.16	.15	1.00

Table 40. Correlations Among 10th Grade Student Subgroups and Scale Scores

	Reading	Practical Living	Gender	Ethnicity	Disability	Lunch
Reading	1.00					
Practical Living	.75	1.00				
Gender	-.23	-.17	1.00			
Ethnicity	-.14	-.14	.00	1.00		
Disability	-.39	-.34	.12	.04	1.00	
Lunch	-.30	-.27	-.01	.16	.16	1.00

Table 41. Correlations Among 11th Grade Student Subgroups and Scale Scores

	Math	Science	Social Studies	Arts & Humanities	Gender	Ethnicity	Disability	Lunch
Math	1.00							
Science	.80	1.00						
Social Studies	.78	.81	1.00					
Arts & Humanities	.70	.71	.79	1.00				
Gender	-.04	.00	-.10	-.18	1.00			
Ethnicity	-.18	-.19	-.15	-.12	-.01	1.00		
Disability	-.40	-.35	-.37	-.33	.10	.06	1.00	
Lunch	-.28	-.26	-.29	-.26	-.03	.16	.16	1.00

Regression Analysis

From the preceding analyses, it is apparent that in spite of the mean differences between subgroups, there is considerable overlap in performance among members of different subgroups. Consequently, the correlations between subgroup membership and student performance tends to account for only a fraction of the total variance among students' scores (at most 4% for gender, 4% for ethnicity, 16% for disability, and 9% for lunch).

Individual students' scores should be influenced by their schools' instructional capacities, and may also be influenced by other school climate factors, including school innovation and the characteristics of the student population as a whole. It is reasonable, therefore, to question the relationship between student subgroup membership and performance independent of school factors. Schools' accountability scores, computed as the mean performance of students within each school, provide an indirect index of these factors. In addition, schools'gains on their index (the bases for Kentucky's accountability classifications) provides an index of the innovative zeitgeist within a school. In order to estimate subgroup effects, independent of school factors, we used multiple regression to first estimate (and account for) school factors and student performance, and then estimate the independent association of subgroup membership and student performance.

Results (Tables 42 through 59) are presented as a series of step-wise multiple regressions. The regression results show that there is a positive relationship between school score and student scores; students in high-scoring schools tend to be high-scoring students. The R-square statistic is positive, but small. The small size of the R-square statistic is an indication that the variation between students' scores within a school tends to be much higher than the variation between schools. In other words, students can have both high and low scores in any school. Gain score, on the other hand, adds nothing to the prediction of students' scores, as indicated by the lack of change in R-square when gain score is added to the equation. The very small regression coefficient is, in most subject area/grade level combinations, negative in direction. This suggests that schools that are gaining are typically lower scoring schools with lower scoring students. This is not surprising given the statistical regression-to-the-mean effect. The very highest scoring schools tend to score slightly lower in the next cycle and the very lowest scoring schools to score slightly higher. The smallness of the negative coefficient is an indication that scores are fairly stable and resistant to this effect.

After taking school-level score and gain score into account, four of the five subgroup variables were added to the regression equation. The LEP variable was not included in this analysis because of the small size of the LEP student population. Only White and African American students were used in the ethnicity analyses for the same reason.

Tables 42 through 59 present findings from the regression analyses for each subject area/grade level combination. In nearly all cases, with the exceptions of adding gender to the prediction of 4^{th} grade science, 7^{th} grade science, and 11^{th} grade math and science, and adding ethnicity to the prediction of 8^{th} grade arts & humanities, subgroup membership did add to the prediction of KCCT score, as indicated by the change in the R-square statistic. Gender and ethnicity generally contributed the least to the prediction of

students' KCCT scores, with the exception of 8th grade math. Here gender accounted for 10% of the variation in KCCT scores and, as indicated by the negative regression coefficient, male students can be expected to score lower than female students. Disability status contributed the most to the prediction of KCCT scores. For example, approximately 15% of the variation in an 8th grade student's math score could be accounted for by that student's disability status. The negative regression coefficient indicates that students with disabilities can be expected to score lower than students without disabilities.

Overall, regression analyses mirror patterns in the previously presented graphs. Students in certain social, ethnic and/or economic groups can be expected to score differently than other students. Regardless of the schools that they are in, females score higher than males, Whites higher than African Americans, students without disabilities higher than students with disabilities, and non-free/reduced lunch students higher than free/reduced lunch students. On the other hand, the effects are small and account for little of the variation among students in general.

Table 42. Regression Analysis[1] for 4th Grade Reading

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.27)			.07
Reading Score	School Score (.28)	Gain Score (-.03)		.07
Reading Score	School Score (.27)	Gain Score (-.03)	Gender (-.12)	.09

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.27)			.08
Reading Score	School Score (.28)	Gain Score (-.03)		.08
Reading Score	School Score (.26)	Gain Score (-.03)	Ethnicity (-.23)	.12

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.27)			.07
Reading Score	School Score (.27)	Gain Score (-.03)		.07
Reading Score	School Score (.26)	Gain Score (-.03)	Disability (-.13)	.09

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.27)			.07
Reading Score	School Score (.27)	Gain Score (-.03)		.07
Reading Score	School Score (.22)	Gain Score (.00)	Lunch (-.19)	.10

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

[1] Regression analysis also serves as a significance test. Non-zero numbers in parentheses indicate statistically significant differences between the subgroup of interest and the comparison group. However, because of the large sample size, statistical significance can be attained even when mean differences are very small.

Table 43. Regression Results for 4th Grade Science

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.27)			.07
Science Score	School Score (.27)	Gain Score (-.02)		.07
Science Score	School Score (.27)	Gain Score (-.02)	Gender (.00)	.07

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.28)			.08
Science Score	School Score (.28)	Gain Score (-.03)		.08
Science Score	School Score (.26)	Gain Score (-.02)	Ethnicity (-.14)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.26)			.07
Science Score	School Score (.27)	Gain Score (-.02)		.07
Science Score	School Score (.26)	Gain Score (-.02)	Disability (-.22)	.12

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.26)			.07
Science Score	School Score (.27)	Gain Score (-.02)		.07
Science Score	School Score (.22)	Gain Score (.00)	Lunch (-.16)	.09

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 44. Regression Results for 5th Grade Math

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.30)			.09
Math Score	School Score (.30)	Gain Score (.00)		.09
Math Score	School Score (.30)	Gain Score (.00)	Gender (-.08)	.10

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.31)			.10
Math Score	School Score (.31)	Gain Score (.00)		.10
Math Score	School Score (.29)	Gain Score (.00)	Ethnicity (-.12)	.11

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.28)			.08
Math Score	School Score (.29)	Gain Score (-.01)		.08
Math Score	School Score (.28)	Gain Score (-.01)	Disability (-.28)	.16

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.30)			.09
Math Score	School Score (.30)	Gain Score (.00)		.09
Math Score	School Score (.24)	Gain Score (.03)	Lunch (-.21)	.13

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 45. Regression Results for 5th Grade Social Studies

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.30)			.09
Social Studies Score	School Score (.30)	Gain Score (.00)		.09
Social Studies Score	School Score (.30)	Gain Score (.00)	Gender (-.08)	.10

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.29)			.09
Social Studies Score	School Score (.30)	Gain Score (-.01)		.09
Social Studies Score	School Score (.27)	Gain Score (-.01)	Ethnicity (-.12)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.30)			.09
Social Studies Score	School Score (.30)	Gain Score (.00)		.09
Social Studies Score	School Score (.30)	Gain Score (.00)	Disability (-.26)	.16

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.28)			.08
Social Studies Score	School Score (.29)	Gain Score (-.01)		.08
Social Studies Score	School Score (.22)	Gain Score (.02)	Lunch (-.22)	.12

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 46. Regression Results for 5th Grade Arts & Humanities

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.30)			.09
Arts & Humanities Score	School Score (.31)	Gain Score (-.02)		.09
Arts & Humanities Score	School Score (.31)	Gain Score (-.02)	Gender (-.13)	.11

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.31)			.09
Arts & Humanities Score	School Score (.31)	Gain Score (-.02)		.09
Arts & Humanities Score	School Score (.29)	Gain Score (-.02)	Ethnicity (-.11)	.11

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.30)			.09
Arts & Humanities Score	School Score (.31)	Gain Score (-.02)		.09
Arts & Humanities Score	School Score (.30)	Gain Score (-.02)	Disability (-.22)	.14

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.30)			.09
Arts & Humanities Score	School Score (.31)	Gain Score (-.02)		.09
Arts & Humanities Score	School Score (.25)	Gain Score (.01)	Lunch (-.20)	.13

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 47. Regression Results for 5th Grade Practical Living

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.28)			.08
Practical Living Score	School Score (.28)	Gain Score (.00)		.08
Practical Living Score	School Score (.28)	Gain Score (.00)	Gender (-.13)	.09

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.28)			.08
Practical Living Score	School Score (.28)	Gain Score (.00)		.08
Practical Living Score	School Score (.26)	Gain Score (.00)	Ethnicity (-.10)	.09

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.28)			.08
Practical Living Score	School Score (.28)	Gain Score (.00)		.08
Practical Living Score	School Score (.27)	Gain Score (.00)	Disability (-.22)	.12

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.28)			.08
Practical Living Score	School Score (.28)	Gain Score (.00)		.08
Practical Living Score	School Score (.22)	Gain Score (.02)	Lunch (-.19)	.11

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 48. Regression Results for 7th Grade Reading

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.27)			.07
Reading Score	School Score (.27)	Gain Score (-.01)		.07
Reading Score	School Score (.27)	Gain Score (-.01)	Gender (-.19)	.11

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.28)			.08
Reading Score	School Score (.28)	Gain Score (-.01)		.08
Reading Score	School Score (.26)	Gain Score (.00)	Ethnicity (-.11)	.09

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.27)			.07
Reading Score	School Score (.27)	Gain Score (-.01)		.07
Reading Score	School Score (.26)	Gain Score (.00)	Disability (-.33)	.18

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.23)			.05
Reading Score	School Score (.23)	Gain Score (.00)		.05
Reading Score	School Score (.19)	Gain Score (.01)	Lunch (-.25)	.11

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 49. Regression Results for 7th Grade Science

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.28)			.08
Science Score	School Score (.28)	Gain Score (-.01)		.08
Science Score	School Score (.28)	Gain Score (-.01)	Gender (-.01)	.08

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.28)			.08
Science Score	School Score (.28)	Gain Score (-.01)		.08
Science Score	School Score (.25)	Gain Score (.00)	Ethnicity (-.16)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.28)			.08
Science Score	School Score (.28)	Gain Score (-.01)		.08
Science Score	School Score (.26)	Gain Score (.00)	Disability (-.31)	.17

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.24)			.06
Science Score	School Score (.24)	Gain Score (.00)		.06
Science Score	School Score (.20)	Gain Score (.01)	Lunch (-.24)	.12

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 50. Regression Results for 8th Grade Math

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.26)			.07
Math Score	School Score (.26)	Gain Score (-.03)		.07
Math Score	School Score (.26)	Gain Score (-.03)	Gender (-.05)	.17

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.26)			.07
Math Score	School Score (.27)	Gain Score (-.03)		.07
Math Score	School Score (.25)	Gain Score (-.02)	Ethnicity (-.13)	.09

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.26)			.07
Math Score	School Score (.26)	Gain Score (-.03)		.07
Math Score	School Score (.25)	Gain Score (-.02)	Disability (-.39)	.22

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.20)			.04
Math Score	School Score (.21)	Gain Score (-.01)		.04
Math Score	School Score (.17)	Gain Score (.00)	Lunch (-.25)	.10

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 51. Regression Results for 8th Grade Social Studies

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.29)			.08
Social Studies Score	School Score (.29)	Gain Score (-.01)		.08
Social Studies Score	School Score (.29)	Gain Score (-.01)	Gender (-.14)	.10

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.29)			.08
Social Studies Score	School Score (.29)	Gain Score (-.01)		.08
Social Studies Score	School Score (.27)	Gain Score (.00)	Ethnicity (-.11)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.28)			.08
Social Studies Score	School Score (.29)	Gain Score (-.01)		.08
Social Studies Score	School Score (.27)	Gain Score (.00)	Disability (-.38)	.23

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.23)			.06
Social Studies Score	School Score (.23)	Gain Score (.01)		.06
Social Studies Score	School Score (.19)	Gain Score (.02)	Lunch (-.28)	.13

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 52. Regression Results for 8th Grade Arts & Humanities

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.29)			.08
Arts & Humanities Score	School Score (.29)	Gain Score (-.01)		.08
Arts & Humanities Score	School Score (.29)	Gain Score (-.01)	Gender (-.20)	.12

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.29)			.09
Arts & Humanities Score	School Score (.29)	Gain Score (-.01)		.09
Arts & Humanities Score	School Score (.28)	Gain Score (-.01)	Ethnicity (-.09)	.09

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.29)			.08
Arts & Humanities Score	School Score (.29)	Gain Score (-.01)		.08
Arts & Humanities Score	School Score (.28)	Gain Score (-.01)	Disability (-.35)	.20

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.24)			.06
Arts & Humanities Score	School Score (.24)	Gain Score (.00)		.06
Arts & Humanities Score	School Score (.20)	Gain Score (.01)	Lunch (-.25)	.12

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 53. Regression Results for 8th Grade Practical Living

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.27)			.07
Practical Living Score	School Score (.27)	Gain Score (-.01)		.07
Practical Living Score	School Score (.27)	Gain Score (-.01)	Gender (-.16)	.10

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.27)			.07
Practical Living Score	School Score (.27)	Gain Score (-.01)		.07
Practical Living Score	School Score (.25)	Gain Score (.00)	Ethnicity (-.10)	.08

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.27)			.07
Practical Living Score	School Score (.27)	Gain Score (-.01)		.07
Practical Living Score	School Score (.25)	Gain Score (-.01)	Disability (-.33)	.18

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.21)			.04
Practical Living Score	School Score (.21)	Gain Score (.00)		.04
Practical Living Score	School Score (.17)	Gain Score (.01)	Lunch (-.25)	.10

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 54. Regression Results for 10th Grade Reading

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.28)			.08
Reading Score	School Score (.28)	Gain Score (-.01)		.08
Reading Score	School Score (.27)	Gain Score (-.01)	Gender (-.22)	.13

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.28)			.08
Reading Score	School Score (.28)	Gain Score (-.01)		.08
Reading Score	School Score (.28)	Gain Score (.00)	Ethnicity (-.14)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.28)			.08
Reading Score	School Score (.28)	Gain Score (-.01)		.08
Reading Score	School Score (.26)	Gain Score (-.01)	Disability (-.38)	.22

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Reading Score	School Score (.28)			.08
Reading Score	School Score (.28)	Gain Score (.01)		.08
Reading Score	School Score (.23)	Gain Score (.00)	Lunch (-.25)	.14

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 55. Regression Results for 10th Grade Practical Living

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.24)			.06
Practical Living Score	School Score (.24)	Gain Score (-.01)		.06
Practical Living Score	School Score (.24)	Gain Score (-.01)	Gender (-.17)	.08

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.24)			.06
Practical Living Score	School Score (.24)	Gain Score (-.01)		.06
Practical Living Score	School Score (.24)	Gain Score (.00)	Ethnicity (-.13)	.08

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.24)			.06
Practical Living Score	School Score (.24)	Gain Score (-.01)		.06
Practical Living Score	School Score (.22)	Gain Score (-.02)	Disability (-.33)	.17

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Practical Living Score	School Score (.24)			.06
Practical Living Score	School Score (.24)	Gain Score (.00)		.06
Practical Living Score	School Score (.19)	Gain Score (-.01)	Lunch (-.23)	.11

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 56. Regression Results for 11th Grade Math

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.27)			.07
Math Score	School Score (.27)	Gain Score (-.02)		.07
Math Score	School Score (.27)	Gain Score (-.02)	Gender (-.04)	.07

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.27)			.07
Math Score	School Score (.28)	Gain Score (-.02)		.07
Math Score	School Score (.27)	Gain Score (-.01)	Ethnicity (-.17)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.26)			.07
Math Score	School Score (.27)	Gain Score (-.02)		.07
Math Score	School Score (.25)	Gain Score (-.02)	Disability (-.38)	.22

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Math Score	School Score (.27)			.07
Math Score	School Score (.27)	Gain Score (.00)		.07
Math Score	School Score (.22)	Gain Score (-.01)	Lunch (-.24)	.13

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 57. Regression Results for 11th Grade Science

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.21)			.05
Science Score	School Score (.22)	Gain Score (-.02)		.05
Science Score	School Score (.22)	Gain Score (-.02)	Gender (.00)	.05

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.22)			.05
Science Score	School Score (.22)	Gain Score (-.01)		.05
Science Score	School Score (.22)	Gain Score (-.01)	Ethnicity (-.18)	.08

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.21)			.05
Science Score	School Score (.21)	Gain Score (-.02)		.05
Science Score	School Score (.19)	Gain Score (-.02)	Disability (-.34)	.16

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Science Score	School Score (.22)			.05
Science Score	School Score (.22)	Gain Score (.00)		.05
Science Score	School Score (.17)	Gain Score (-.01)	Lunch (-.23)	.10

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 58. Regression Results for 11th Grade Social Studies

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.28)			.08
Social Studies Score	School Score (.28)	Gain Score (-.01)		.08
Social Studies Score	School Score (.28)	Gain Score (-.01)	Gender (-.10)	.09

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.28)			.08
Social Studies Score	School Score (.29)	Gain Score (-.01)		.08
Social Studies Score	School Score (.28)	Gain Score (-.01)	Ethnicity (-.14)	.10

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.28)			.08
Social Studies Score	School Score (.28)	Gain Score (-.01)		.08
Social Studies Score	School Score (.26)	Gain Score (-.01)	Disability (-.35)	.20

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Social Studies Score	School Score (.28)			.08
Social Studies Score	School Score (.28)	Gain Score (.02)		.08
Social Studies Score	School Score (.23)	Gain Score (.00)	Lunch (-.25)	.14

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Table 59. Regression Results for 11th Grade Arts & Humanities

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.27)			.07
Arts & Humanities Score	School Score (.27)	Gain Score (-.01)		.07
Arts & Humanities Score	School Score (.27)	Gain Score (-.01)	Gender (-.18)	.10

Females coded as 0; Males coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.27)			.08
Arts & Humanities Score	School Score (.28)	Gain Score (-.01)		.08
Arts & Humanities Score	School Score (.27)	Gain Score (.00)	Ethnicity (-.11)	.09

White coded as 0; African American coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.27)			.07
Arts & Humanities Score	School Score (.27)	Gain Score (-.01)		.07
Arts & Humanities Score	School Score (.25)	Gain Score (-.01)	Disability (-.31)	.17

Students without disabilities coded as 0; Students with disabilities coded as 1

Dependent Variable	Predictor Variables with Standardized Coefficients			R^2
Arts & Humanities Score	School Score (.28)			.08
Arts & Humanities Score	School Score (.27)	Gain Score (.02)		.08
Arts & Humanities Score	School Score (.23)	Gain Score (.01)	Lunch (-.22)	.12

No free/reduced lunch coded as 0; Free/reduced lunch coded as 1

Summary and Discussion

The current research found expected differences among the five student subgroups of interest. Female students, with few exceptions, scored consistently higher than males. White students scored higher than African American and Hispanic students, English-speaking students scored higher than those with limited proficiency in English, non-disabled students scored higher than students with disabilities, and students from higher socioeconomic backgrounds scored higher than those from lower socioeconomic backgrounds (using lunch status as a proxy).

In almost all cases, the two subgroups being compared experienced similar mean score fluctuations over the four-year period, resulting in gaps that were essentially unchanged. Certain content area/grade level combinations did experience a slight narrowing or widening of the gap between subgroups, but in no case did the gap increase more than 12.53 scale score points (non-disabled v. disabled 11^{th} grade arts & humanities) or decrease more than 12.66 points (non-LEP v. LEP 5^{th} grade practical living). These two values are quite extreme when considering that 79% of the gap changes over the four-year period were 5 scale score points (or about 1/10 of a standard deviation) or less in either direction. In no case were changes in either direction systematic over the four years.

Multiple regression analysis was conducted to further explore the relationship between student subgroup membership and academic achievement. When added to the regression equations, all student subgroup variables added slightly to the predictability of student-level test scores, indicating that student subgroup status is related to achievement on assessments such as the KCCT. The small R-square values for these regressions, however, indicate that considerable overlap exists in the score patterns of all the subgroups of interest. Merely knowing that a student is a member of any of the subgroups included in this study tells us very little about that student's likely score on the KCCT.

Achievement scores (KCCT) of Kentucky students' from the various social, cultural and economic backgrounds reflect patterns commonly found on other state-level or national measures of student achievement (Thacker & Hoffman, 1999; Bacci, Koger, Hoffman, & Thacker, 2003). In addition, these differences among student subgroups have remained fairly stable over the last four years with neither systematic gains nor losses. We have included information on score ranges as well as mean in order to ensure a more complete picture of "gap" issues as all states, including Kentucky, face NCLB pressure to close the gaps. Overall, gaps between Kentucky's student subgroups are small. As presented in the current report, to the extent that variability exists within each subgroup, it is difficult to predict an individual student's score based on knowledge of subgroup membership. In most cases, members of a lower performing subgroup can and do score higher than the mean score of the higher performing group.

Students' performance on the National Assessment for Educational Progress (NAEP) corroborates the notion that Kentucky's gap for ethnicity in particular is small compared

to the rest of the nation. In 1998, Kentucky had the sixth smallest gap in reading achievement between African American and White 4th-graders, out of 36 participating states (Education Trust, 2003). Our findings suggest that by targeting members of certain student subgroups based on an assumption of low achievement levels, educators may be over-identifying students as low performers and targeting subgroups for "remedial" programs when our data suggest that subgroup membership may not be a good index of students' need for remediation. There are two alternatives. One alternative is to treat students as individuals, improving their performance from whatever level of achievement they currently exhibit. For many Kentucky schools with small minority populations, this may be the solution of choice. The other alternative is further exploration of past research that has explored the possibility of differing learning styles among ethnic groups (Burger, 1971; Peck, 1977; Melear, 1995). Though the current report makes no assertions of learning style differences, this could be an area of further exploration in an effort to reevaluate targeting strategies. Further elaboration of either approach is beyond the scope of this report. The data simply suggest that elaboration is needed.

Finally, it is important to continue to monitor gaps in student achievement in order to ensure that Kentucky is meeting the educational needs of all its students. It is recommended that the present analysis be replicated during subsequent testing years and expanded to include comparisons of student-level scores over time. For example, next year (after the 2003 data is released) there will be five years of data on KCCT. At that point, student-level scores can be predicted using their previous KCCT performance on the same subject test. Tenth- and eleventh-grade students' scores can be predicted from their performance on the seventh- and eighth-grade KCCT tests. Seventh- and eighth-grade students' scores can be predicted from their performance on the fourth- and fifth-grade KCCT tests. The present analysis could be further elaborated by obtaining regression results for the subgroups of interest using their previous scores as predictors.

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